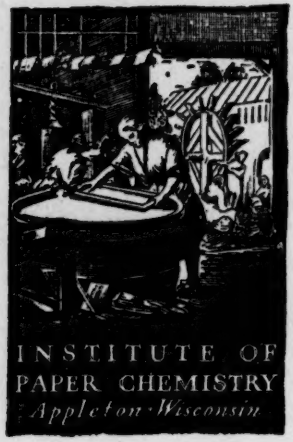
PAGES 71-140

BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

LIBRARY NOTES

OCTOBER · 1948

Volume 19 Number 2

AUTHOR INDEX TO BOOKS

The American Pulp and Paper Mill Superintendents Association, Inc. 72
American Society for Testing Materials. *Committee D-20 on Plastics* 73
von Asten & Companie, Aktien-Gesellschaft 72
Badische Anilin- & Soda-Fabrik 71
Barrell, W. L., Co. 72
The Calco Chemical Company, Inc. *Heller & Merz Division* 72
Chemical Society, *London* 71
Chien, S. S., ed. 73
[China] Ministry of Industry. *Forestry and Agriculture Department* 73
Ellis, E. T. 71
I. G. Farbenindustrie A. G., comp. 71
International Paper Company 72
Japanese Government. *Board of Trade* 72
Judkins, J. 73
Kerr, C. 71
McNair, M. P. 71
Meriam, R. S. 71
National Aniline & Chemical Company, Inc. 72
National Planning Association. *Committee on the Causes of Industrial Peace under Collective Bargaining* 71
Newport Chemical Works, Inc. 72
Osborn, A. S. 71
Randall, R. 71
Science Society of China. *Biological Laboratory* 73
Sweet's Catalog Service 73
U. S. Dept. of Commerce 73
Walden, Sons & Mott, Inc. 73
Weston, Harry E., comp. 73

AUTHOR INDEX TO ABSTRACTS

The letter P preceding a page number indicates a patent abstract.

Adams, M. E. 105
Addressograph-Multigraph Corporation P 137
Aggarwala, J. C. 98
Aktiebolaget Kamyr P 131
Allen, H. H. P 139
American Bemberg Corporation P 137
American Cyanamid Company P 140
The American Pressman 109
Anerson, G. W. 118
Arledter, H. 102
Armitage, F. D. 95
Aronovsky, S. I. 118
Arpin, E. P., Jr. P 134
Arthur, J. C., Jr. 105
Auchter, R. J. P 135
Auernheimer, A. H. 120
Bade, O. M. 87
Baker, R. R. 101
Baker, W. E. B. P 135
Barnes, W. L. P 131
Baser, N. 86
Beaty, J. D. P 137
Behr-Manning Corporation P 136
Bemis Bro. Bag Co. P 139
Bernfeld, P. 115, 116, 117
Bettendorf, H. J. 77, 82, 85, 99, 113, 114, 125
Bird Machine Company 94
Bourne, E. J. 116
Broughton, A. E. 94
Browning, B. L. 81
Brunes, B. 122
Bryce, W. H. P 135
Buchanan, A. S. 123
Bullock, W. B. 124
Buttery, K. T. P 131
Callahan, T. P. 113
Campbell, D. P 130
Campbell, R. C. P 130
Cass, T. F., Jr. P 133
Champion Paper Mills Limited P 136
The Champlain Company 94
Chandler, J. B. 90
Chaplin, M. P. P 134
Chaplin Corporation P 134
Chapman, F. H. P 132
Chemical Engineering 98
The Chemical Foundation, Incorporated P 139
Chemical Industries 91, 113
Chipman, W. A., Jr. 119
Ciba Limited P 130
Clark, G. S. 76
Cobb, A. L. 125
Consden, R. 82
Container Corporation of America P 133
Cool, O. C. 97
Craig, K. A. P 135
Crawford, S. 119
Cronin, H. J. P 130
Denny, J. L. 113
De Reamer, W. J. P 136
Dilley, D. C. P 134
Dixie Wax Paper Company P 135
The Dow Chemical Company P 139
Dryden, C. L. 97
Duebener, Lydia P 136
Duffey, H. R. 87
Dutton, N. 87
Dyer, H. J. P 139
Eastman Kodak Company P 129, P 130
Ekwall, A. 119
Ellinger, G. A. 84
Ernst, A. J. 118
Fafnir Bearing Company 91
Farber, E. P 132
Farrant, J. L. 96
Farrel-Birmingham Company, Inc. 92
Farrell, R. A. P 136
Forsyth, W. G. C. 80
Fowler, W. F., Jr. 80
Frankenstein, William P. P 138
Fraser, D. R. 74
Freel, W. G. P 138
Fuld, M. 115, 116
Fuller, C. H. F. 117
Fullerton, F. H. 101
Gadd, G. O. 88
Gaylord Container Corporation P 138
Goat, A. F. 109
Goldenberg, N. 117
Grant, J. N. 85
Grecco, L. P. P 138
Green, G. H. 117
Hall, A. G. 100
Hanway, P. S. 113
Harness, R. R. P 138
Harris, E. E. 127, 128
Harrison, J. J. P 131
Haskell, J. D. 91
Haskell, W. D. 95
Haworth, N. 116
Hendrickson, R. A. 95
Hervey, L. R. B. P 135
Heymann, E. 123
Hirschhorn, L. P 132
Hitchcock, L. B. 87
Hixson, A. W. P 139
Hock, C. W. 96
Hodge, A. J. 96
Hoeltzel, O. R. 89
Hoffman, A. W. 113
Hoffmann Jacobsen, P. M. 106
Hogan, R. J. 110
Hohf, J. P. 78
Hood, R. L. P 140
Hough, M. 101
Hunter, R. S. 105
Imset, O. 106
The International Paper Box Machine Company P 132
International Paper Company P 130
Irion, C. E. P 132
Irmscher, H. O. P 133
Jaatinen, B. 91
Jayme, G. 76
Jenkins, J. H. 88
Jeppson, G. N. P 137
Johnson, M. C. 127, 128
Johnstone, H. F. 82
Jones, S. F. P 138
Jullander, I. 126
Kantrowitz, M. S. 105
Keller, E. L. 121
Kendall, J. T. 76

(Continued on inside back cover)

BULLETIN

of

THE INSTITUTE of PAPER CHEMISTRY

AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

OCTOBER · 1948

Volume 19 Number 2

LIBRARY NOTES

The Bulletin of The Institute of Paper Chemistry is published monthly at Appleton, Wisconsin, by the Board of Trustees of The Institute of Paper Chemistry. Entered as Second Class matter, November 13, 1930, at the postoffice at Appleton, Wis., under the act of August 24, 1912.

THE INSTITUTE OF PAPER CHEMISTRY

Board of Trustees

OFFICERS

ERNST MAHLER	President
D. C. EVEREST	Vice-President
JOHN L. RIEGEL	Vice-President
WESTBROOK STEELE	Executive Director
JOHN G. STRANGE	Secretary-Treasurer
C. B. SITTERSON, JR.	Assistant Secretary

TRUSTEES

NATHAN M. PUSEY, President of Lawrence College, ex officio

For the term expiring in 1948

ALEXANDER CALDER, Union Bag & Paper Corporation, New York, N.Y.
SYDNEY FERGUSON, The Mead Corporation, Dayton, Ohio.
ERNST MAHLER, Kimberly-Clark Corporation, Neenah, Wis.
W. IRVING OSBORNE, JR., Cornell Wood Products Company, Chicago, Ill.
KARL E. STANSBURY, Thilmany Pulp and Paper Company, Kaukauna, Wis.

For the term expiring in 1949

D. C. EVEREST, Marathon Corporation, Rothschild, Wis.
DAVID L. LUKE, JR., West Virginia Pulp and Paper Company, New York, N.Y.
JOHN L. RIEGEL, Riegel Paper Corporation, New York, N.Y.
REUBEN B. ROBERTSON, SR., The Champion Paper and Fibre Company, Canton, N.C.
NORMAN W. WILSON, Hammermill Paper Company, Erie, Pa.

For the term expiring in 1950

DAN K. BROWN, Neenah Paper Company, Neenah, Wis.
GEORGE E. DYKE, Robert Gair Company, New York, N.Y.
STUART E. KAY, International Paper Company, New York, N.Y.
A. B. LAYTON, Crown Zellerbach Corporation, San Francisco, Calif.

STANDING COMMITTEES OF THE TRUSTEES

EXECUTIVE COMMITTEE: Ernst Mahler, Chairman; D. K. Brown, George E. Dyke, David L. Luke, Jr., and Karl E. Stansbury.

INVESTMENT COMMITTEE: Ernst Mahler, Chairman; D. K. Brown, John G. Strange, and Ralph J. Watts.

COMMITTEE ON ACADEMIC POLICY: Nathan M. Pusey, Chairman; Rex Hovey, Harry F. Lewis, Ernst Mahler, John L. Riegel, Westbrook Steele, and John G. Strange.

Books and Pamphlets Added to the Library During September

CHEMISTRY—YEARBOOKS

CHEMICAL SOCIETY, *London.* Annual reports on the progress of chemistry for 1947. London, The Society. v. 44. 327 p.

COLLECTIVE BARGAINING

KERR, CLARK, and RANDALL, ROGER. Crown Zellerbach and the Pacific Coast pulp and paper industry; a case study. Case study no. 1 prepared for the NPA Committee on the Causes of Industrial Peace under Collective Bargaining. Washington, National Planning Association [1948] 78 p.

CONTAINERS

ELLIS, E. T. Paperboard packet and cardboard box manufacture; a practical and exhaustive treatise intended to meet the requirements of manufacturers and traders. Re-issue. London, The Technical Press Ltd., 1948. 368 p.

DYES AND DYEING

BADISCHE ANILIN- & SODA-FABRIK, *Ludwigshafen a/Rhein.* Kurzer Leitfaden für die Anwendung der Farbstoffe der Badischen Anilin- & Soda-Fabrik, Ludwigshafen a/Rhein auf dem Gebiete der Färberei. 1913. 454 p.

ECONOMICS

MCNAIR, MALCOLM P., and MERIAM, RICHARD S. Problems in business economics. New York, McGraw-Hill Book Co., 1941. 654 p.

FORGERY

OSBORN, ALBERT S. The problem of proof, especially as exemplified in disputed document trials; a discussion of the proof of the facts in courts of law, with some general comments on the conduct of trials. 2d ed. Newark, The Essex Press, 1926. 539 p.

OSBORN, ALBERT S. Questioned documents. 2d ed. Albany, N.Y. Boyd Printing Company, 1940. 736 p.

GERMAN LANGUAGE

I. G. FARBENINDUSTRIE A. G., comp. Fachwörterbuch für die Farbstoffe und Textilhilfsmittel verbrauchenden Industrien. German-English. New York, Dictionaries, Inc. [c1947] 489 p.

METALLURGY

METAL INDUSTRIES CATALOG. 6th ed. 1948. New York, Reinhold Publ. Corp. [c1948] 412 p.

PAPER—DYEING

The CALCO CHEMICAL COMPANY, Inc. *Heller & Merz Division, Bound Brook, New Jersey.* Colors for paper. Bound Brook, N.J., The Company [c1938] 208 p.

NATIONAL ANILINE & CHEMICAL COMPANY, Inc. Dyes for paper. 3d rev. ed. New York, The Company, n.d. 5 p., 21 plates.

NEWPORT CHEMICAL WORKS, Inc., *Passaic, New Jersey.* Newport products; preparations for increasing the absorptive capacity of fibrous material. Bulletin NP 10. Passaic, N.J., The Corporation, n.d. loose-leaf. no paging.

PAPER—SAMPLE BOOKS

JAPANESE GOVERNMENT. *Board of Trade.* Samples of paper. Series 1947—1 and 2. Board of Trade, 1947. 2 v. no paging.

PAPER MAKING AND TRADE—HISTORY

VON ASTEN & COMPANIE, AKTIEN-GESELLSCHAFT. Die Gebräuche der Papiermacher, wie solche in teutschen Landen einst mündlich überliefert gewesen; denen wohledlen grossachtbaren und kunsterfahrenen Herren Papiermachern zu Nutz und Frommen zugeeignet von dero getreuen Filzmachern von Asten & Co., Akt.- Ges. Auf der Nepomukmühle zu Stolberg (Rhld.) [herausgegeben von den Asten'schen Filztuchwerken] 1934. 52 p.

INTERNATIONAL PAPER COMPANY. After fifty years, 1898-1948 [New York, The Company, c1948] 112 p.

PAPER MAKING AND TRADE—YEARBOOKS

BARRELL'S Paper annual 1948-1949. Lawrence, Mass., William L. Barrell Co. [1948] v. 7. 54 p.

PAPER-MAKING MACHINERY

The AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION, Inc. Preventive maintenance in pulp and paper mills. A partial record of the proceedings of the General Maintenance Conference held March 25th to 29th inclusive, 1946, Hotel Manchester, Middletown, Ohio. Conference conducted under the supervision of The American Pulp and Paper Mill Superintendents Association, Inc. Westbrook, Maine, H. S. Cobb Printing Co., c1948. 80 p.

PLASTIC MATERIALS

AMERICAN SOCIETY FOR TESTING MATERIALS. *Committee D-20 on Plastics.* A.S.T.M. standards on plastics. Specifications. Methods of testing. Nomenclature. Definitions. Philadelphia, The Society, 1948. 595 p.

BRITISH PLASTICS year book 1948; a classified guide to the plastics industry. 18th year of issue. London, Iliffe & Sons Ltd., c1948. 479 p.

TRADE AND PROFESSIONAL ASSOCIATIONS

JUDKINS, JAY. United States associations in world trade and affairs. U. S. Dept. of Commerce. Industrial series no. 70. Washington, U. S. Govt. Print. Off., 1947. 125 p.

TRADE DIRECTORIES

PAPER AND PULP MILL CATALOGUE; engineering handbook (Collection of useful information for pulp and paper manufacturers, comp. by Harry E. Weston) 1948-49. 25th annual ed. Chicago, Fritz Publications, Inc. [c1948] 516 p.

SOURCE of supply directory. 1948 edition. Chicago, Howard Publ. Co., 1948. v. 23. 751 p.

SWEET'S file. Process industries; a file of manufacturers' catalogs compiled especially for the use of engineers, operating and maintenance officials of the process industries. New York, Sweet's Catalog Service, c1948. Various paging.

WALDEN'S ABC guide, 1948 edition. A directory and buyers guide for the paper and allied trades. New York, Walden, Sons & Mott, Inc. [1948] 456 p.

TREES

CHIEN, S. S., ed. Icones of Chinese forest trees. Published by The Forestry and Agriculture Department of the Ministry of Industry and the Biological Laboratory of the Science Society of China. Book I. 1937. 201 p. [In Chinese]

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ADVERTISING

ANON. Decorative ties and printed strings offer added sales appeal. Paper Sales 8, no. 9: 22-3, 42, 44, 46-8 (September, 1948).

In the buyer's market now developing, decorative ribbons and printed strings are becoming increasingly important for maintaining high sales volume. The latter is not only a means of drawing attention to the package, but also advertises the store or product brand name. Bulk quantities of gift ribbons for store use are sold to department, accessory, gift, candy, and book stores, as well as to others. An equally important market for the paper salesman is that for resale packages of gift ribbons and papers. Flat string is used widely by tanneries, electrical motor and transformer manufacturers, and other industries, and in retail stores. In conclusion, a question and answer section is given presenting information on the types of gift ribbon and printed string, their manufacture, available widths, etc. R.R.

DUTTON, NORBERT. The designer's function. Paper Box Bag Maker 106, no. 2: 55-7 (August, 1948).

In addition to protecting and identifying its contents, the package also advertises, and does this under circumstances in which an immediate response is possible or where it may enter into the consumer's daily life. Designs procured at no cost, whatever the source may be, are likely to be worth just what is paid for them. When a designer is employed, he should be given the information he needs to do his job well. He must know about the market for which the product to be packaged is intended, other products sold by the company, competitors' packages, and the character of the producer's business and marketing policy. He should be allowed to see the factory, talk to salesmen, and spend time in retail outlets if he wishes. Alterations in his design should be made only after he has given his reasons for his choice. An essentially sound design will grow on the producer as he becomes accustomed to it. R.R.

ALCOHOL

LANGLYKKE, A. F., VAN LANEN, J. M., and FRASER, D. R. Butyl alcohol from xylose saccharification liquors from corncobs. Ind. Eng. Chem. 40, no. 9: 1716-19 (September, 1948); *cf.* B.I.P.C. 15: 199.

Xylose saccharification liquors obtained from corncobs in the first stage of a two-stage hydrolysis procedure may be fermented by a selected strain of butyl alcohol-forming bacteria if these liquors are supplemented by powdered iron or treated with activated charcoal prior to fermentation. Powdered iron serves to remove copper from hydrolyzates produced in copper-bearing equipment and, through its effect on oxidation-reduction potentials, also improves the environment for the bacteria. Solvents production and distribution obtained in the fermentation of the xylose liquors are comparable with those obtained with glucose and molasses media. E.S.

LARINKARI, J. World policy of industrial alcohol production. Finnish Paper Timber J. 30, no. 14: 235-40 (July 31, 1948). [In Finnish; English summary]

A review is presented regarding the world production of industrial alcohol, the cost of production from different sources, and the future outlook, with particular reference to the Finnish manufacture of sulfite alcohol. E.S.

ASPLUND PROCESS

LOWGREN, UNO. Wood pulping by the Asplund Defibrator. Paper Trade J. 127, no. 12: 41-3 (Sept. 16, 1948).

Wood chips are pulped in the Asplund Defibrator at elevated temperatures in a steam atmosphere corresponding to pressures of between 125 and 175 p.s.i. The wood chips are continuously introduced into a high temperature preheating chamber by means of a screw or a reciprocating plunger feed. Heating by saturated steam at temperatures ranging from 350 to 370° F. causes softening of the binding substances (the so-called "middle lamella" between the individual fibers). After passage through the preheating chamber, the heated chips are carried to grinding disks where the fibers are separated. After defibration, the pulp is blown from the defibrating chamber through reciprocating or nozzle valves to a collector under atmospheric pressure. The pulp produced, the so-called "Asplund fiber," is quite free and consists mostly of undamaged fibers. The steaming and defibration process does not affect the chemical composition of the pulp to any great extent unless chemical agents are present during the operation. Power consumption is low. The fiber produced is suitable for building boards (such as insulating and hardwood), for roofing felts as rag substitute, and as bulk fiber. E.S.

ASSOCIATIONS

ANON. Organization and functions of the Canadian Pulp and Paper Association. Pulp Paper Mag. Can. 49, no. 9: 63-5 (August, 1948).

The purposes and objectives of the Canadian Pulp and Paper Association are outlined. The principal sections are: Technical; Woodlands; Trade Sections (Chemical Pulp, Mechanical Pulp, Board, Book and Writing, Specialty Papers, and Wrapping Paper); Industrial Relations; and Traffic. In addition to sectional activities, there is a range of departmental, committee, and other activities, covering fields common to all sections; these include: the Information Office, Trade Development and Tariff Department, Statistical Department, and the Pulp and Paper Research Institute of Canada. The latter is an organization apart from the Association, which is supported jointly by the industry by way of a grant from the Association, the Dominion Government, and McGill University. In addition to the regular and continuing activities mentioned, special duties and functions may also be undertaken within the limits of the by-laws of the Association. E.S.

BAGASSE

LATHROP, E. C. The industrial utilization of sugarcane bagasse. Sugar J. 10, no. 6: 5-7, 19-30 (November, 1947).

Normally, about 20,000,000 tons of bagasse are produced annually in the manufacture of cane sugar, only slightly more than 500,000 tons of which are used. The annual production in the United States and its possessions amounts to 3,000,000 tons. Agricultural residues are a cellulose reserve practically untouched and unexplored. Their industrial utilization depends on

their procurement on a sound economic basis, a determination of uses based on their superior or unique properties, the elimination of waste products to the greatest extent, the exploration of markets, the perfection of merchandising plans, and the arrangement for proper financing before any investment is made in plant facilities. The author discusses the utilization of bagasse in building materials, plastics, mulch, and litter, and of the pith as a filler in low-density, permissible-dynamite explosives. Potentially successful uses for bagasse are suggested as in papermaking, nine-point corrugated board, mulch paper, fine and specialty papers, chemical dissolving pulps, and industrial chemicals such as furfural, pentose sugars, and synthetic liquid fuels. Data are tabulated on the physical and chemical composition of varieties of sugarcane and bagasse, the chemical composition of some American woods, and fiber dimensions of some papermaking materials. 24 references.
R.R.

BEECHWOOD

JAYME, G. The production of furfural and pulps low in pentosans from red beechwood. Angew. Chem. A 59, no. 5/6: 150-5 (May/June, 1947). [In German] *cf.* B.I.P.C. 11: 191, 346-7.

The author gives a resume of experiments made on the prehydrolysis and pulping of red beechwood, with special reference to the formation of furfural and the bleaching of sulfate beech pulp. Much of this work was previously published. 27 footnotes.
L.E.W.

BENTONITE

KENDALL, J. T. A note on bentonite film as a dielectric. J. Soc. Chem. Ind. 67, no. 5: 210 (May, 1948).

Films obtained by removing the water from colloidal suspensions of bentonite clays were first studied by Hauser and Le Beau (*cf.* B.I.P.C. 10: 117). It has been claimed that such films, particularly after a further waterproofing treatment, are suitable for use as condenser dielectrics and insulation, replacing mica. The present note gives the results of an investigation into their electrical and other properties, which indicate that such films compare very unfavorably with mica and that further development seems rather doubtful.
E.S.

BOARD

CLARK, GRIFFITH S. The uses and abuses of fiberboard in modern construction. Paper Trade J. 127, no. 12: 53-4 [T.S. 395-6] (Sept. 16, 1948).

With the increase in the usage of fiberboard for construction purposes, it becomes the responsibility of the manufacturer to provide the customer with adequate information so that the product is used to its greatest advantage. The right type of material should be sold for each particular application and instructions should be given as to the method of use. The user should be cautioned to use adequate stud spacing, to compensate for expansion caused by moisture, to apply a proper plaster base if the board is to be plastered, and to use proper nailing techniques. Suggestions are given.
E.S.

MORY, HEINRICH. Dielectric strength of electrical pressboard (presspahn) and its dependence on paper-technological operations. Das Papier 2, no. 9/12: 178-81 (May-June, 1948). [In German]

The author discusses briefly the dielectric strength of presspahn (I) in air, giving experimental data showing that the breakdown voltages increase with increase in degree S.-R., and with increasing unit weight (kg./sq. dm.) of the

board, and also (very slightly) with the number of layers of paper/mm. thickness. The relationship between (hot) transformer oil absorption by (I) and the density of (I) is also shown. The principal requirements for a (I) to be used in transformer construction are: maximum heat stability and high dielectric strength under oil, a definite oil-absorptive capacity, and the lowest possible ash content. L.E.W.

BOARD—STATISTICS

BETTENDORF, HARRY J. Paperboard mill industry statistics. Fibre Containers 33, no. 8: 139-47 (August, 1948); *cf.* B.I.P.C. 18: 81.

Mill tonnage has been at record levels in 1947 and in the first half of 1948. With the return of more normal markets, marginal mills have been experiencing increasing trouble; some that were operated as an emergency measure during the war have already shut down. This has been hastened by the placing into operation of four new kraft board machines with capacities in excess of 2000 tons board daily. The quality of paperboard has improved considerably recently. Big developments in the industry have been the trends toward machine coating; lamination of films of various kinds to board or impregnating or coating boards with materials that add desirable properties; and the combination of boards with wood and other materials. The trend toward combined mill operation still continues. Another significant development in the industry is the increasing consciousness of improvement in operations, including by-product recovery. The over-all capacity of board mills from 1940 to 1947 increased about 36% and the number of Fourdrinier machines in operation about 20%, whereas the number of cylinder mills in operation decreased 1%. Statistical data on annual paperboard mill production by grades and price trends are given. E.S.

WHITING, GRAFTON. The paperboard industry. Fibre Containers 33, no. 8: 76, 78, 83-4 (August, 1948); *cf.* B.I.P.C. 18: 81-2.

With the increase in production resulting from plant improvement and the introduction of new capacity, the output of board in 1948 has closed the gap between supply and demand; inventories in the hands of the fabricators have been built up to a satisfactory working level. The "days-to-run" order situation has dropped from a high level of 20 days in 1945-46 to 12.1 days in June, 1948. The average weekly production of 175,800 tons in 1947 advanced to 186,700 tons during the first half of 1948. During this time 12 more machines were added to the existing capacity, equal to an 8.5% gain. An analysis of the volume of each board group during the first six months shows that containers accounted for 52.1%, folding boxes for 23.2%, setup boxes for 6.9%, and all other uses for 17.8% of the total. The high level of operations would not have been possible without an ample supply of raw materials, both wood pulp and waste paper. The outlook for general business during the remainder of this year is considered favorable. The paperboard industry follows the general business trend as the main controlling factor. Fluctuations in individual enterprises are offset by the wide diversification of the uses of paperboard. E.S.

BOARD TESTING—PHYSICAL

ÖGLAND, N. J. The swelling and shrinkage of hard fiberboards. I. Svensk Papperstidn. 51, no. 16: 357-60 (Aug. 31, 1948). [In Swedish; German and English summaries]

When drying a moist board, part of the swelling in thickness is retained, whereas the board contracts in the machine direction. A gradual contraction in this direction also takes place when the board is stored at relative humidities, varying frequently from 30-90%. By evacuating the sample under wa-

ter the swelling properties may be determined fairly rapidly; the maximum swelling, corresponding to the value of 100% R.H., can in general be evaluated after an immersion of 24 hours. The shrinkage is determined after drying the sample in an oven. The author points out that data obtained in experiments on water absorption after short immersion periods give no information on the swelling behavior in moist air. Tabulated data and several diagrams are included E.S.

QUINN, DON. The ring test of container boards. Fibre Containers 33, no. 8: 197 (August, 1948); *cf.* B.I.P.C. 18: 284.

Reference is made to further data confirming the correlation of the ring test as an evaluation of stiffness of liners and 9-point boards with compression tests on boxes made from these boards. E.S.

TURNER, H. DALE, HOHF, J. P., and SCHWARTZ, S. L. Effect of some manufacturing variables on the properties of fiberboard prepared from milled Douglas-fir. Paper Trade J. 127, no. 9: 43-50 (Aug. 26, 1948).

In the processing of wood into fiberboard sheet materials, there are many interrelated processing variables which have a significant effect upon the quality of the final product. In the present paper, the authors discuss the results of tests conducted at the U.S. Forest Products Laboratory, employing three similar pulps prepared by wet grinding raw Douglas fir. The tests included conditions affecting drainage rates, solids contents of the wet-pressed pulp mat, specific gravity of the dried mat, and the relationship of fiberboard strength to both specific gravity and power consumption. Numerous curves are presented and many of the relationships follow well-defined mathematical laws. These data, although not specifically applicable to any fiberboard process, may be of considerable use in reducing the amount of experimental work needed to evaluate techniques of pulp processing and fiberboard manufacture. It was beyond the scope of the present work to attempt a correlation of these data with operating characteristics of a production-size installation. E.S.

WINK, WILLMER A., and VAN DEN AKKER, J. A. An accelerated method for measuring the penetration of water in insulation board. Paper Trade J. 127, no. 10: 35-40 [T.S. 371-6] (Sept. 2, 1948); *cf.* B.I.P.C. 18: 8.

The present work is an outgrowth of a previously reported investigation of the penetration of liquid water in insulation board. It has been shown that a moderate elevation of the temperature appreciably increased the penetration rate; this has been taken as the basis for an accelerated method. The laboratory manipulations have been simplified, and improved means for determining the degree of penetration of water have been developed. Penetration data for samples of insulation board supplied by eleven manufacturers were obtained at 100, 120, and 130° F. In every case, it was found that the new method for measuring the degree of penetration agreed with data on the distribution of water in the board. A large accelerating factor was found at 130° F., and the relative ranking of samples with regard to resistance to penetration of water at that temperature was observed to be substantially the same as that existing at 100 and 120° F.; in the case of the five samples having the least resistance to penetration, the ranking was the same at these three temperatures. An accelerated mill control test is proposed. E.S.

BUSINESS CONDITIONS

ZELLERBACH, J. D. The pulp and paper industry and the C.E.D. Pulp & Paper 22, no. 10: 58, 60 (September, 1948); *cf.* B.I.P.C. 15: 124.

After briefly referring to the essentiality of the pulp and paper industry and its sensitivity to changes in the scale of general economic activity, the author discusses the purpose and activities of the Committee for Economic Development (C.E.D.), devoted to avoiding the drastic swing between boom and bust and supported entirely by voluntary contributions from hundreds of business concerns. Arguing that depressions are not "acts of God," but man made, the public hazards of booms and busts can be greatly reduced if something is done about them instead of accepting them as inevitable. Originally the C.E.D. was set up in two divisions, the field development and the research division. The work of the field development division was terminated early in 1946; the work of the research division still continues. All its activities are directed toward the central target of a more stable dynamic economy with high-level employment and production. The program and procedures employed are described briefly. E.S.

CELLOPHANE

PENN FRUIT COMPANY, *Philadelphia.* Penn Fruit's meat packaging. Modern Packaging 22, no. 1: 102-7 (September, 1948).

This report is concerned with the experiences of the Penn Fruit Co. in two years of prepackaging fresh meats at the retail level. The change to prepackaging and self service was made to facilitate more rapid sales with the resultant greater volume. The prepackaging is done at the retail stores to make possible close attention to the quality of the product. After several tests, a shallow, rectangular, molded pulp tray was chosen for machine wrapping with a transparent film overwrap. Delicatessen items are packaged at the central kitchens in conventional cylindrical waxed paperboard containers with cellophane-window lids. Other precooked foods are packaged at the stores in molded pulp boats with deeper sides and in wax-impregnated paperboard boats; prepackaged fresh poultry is also packaged in these containers. For red meats, MSAT-80 Cellophane is used as the overwrap, for cold cuts, LSAT-300 Cellophane. A parchment paper liner is usually put at the bottom of the molded trays for extra protection. Hand wrapping seems adequate for departments handling up to 20,000 pounds of fresh meat per week. This company machine wraps 75% of its packages; all roasts are hand wrapped. Rewraps average at least 10% on the most perishable items. Customer preference is toward smaller packages in self service than otherwise; larger packages are more popular near the end of the week. Paperboard labels carry the price and weight of the item and the code date on which it was packaged. It has been found that a horseshoe arrangement in the packaging department is more efficient for decreasing traffic, whereas a straight-line arrangement is more flexible. A large volume self-service operation with prepackaging done in the store is more efficient and economical as far as labor costs are concerned than a service operation. Average packaging material costs in dollars and cents are less for self service, but percentage-wise they are higher because of the smaller size of the average self-service package. R.R.

VALZ, ARTHUR M. Meat goes self-service. Du Pont Mag. 42, no. 5: 26-7 (September-October, 1948).

In a brief survey of the prepackaging of fresh meat and of self-service units for its sale, mention is made of MSAT-80 and LSAT Cellophane,

which are used for such purposes. Methods of wrapping and display are illustrated. R.R.

CELLULOSE—HEMICELLULOSE

FORSYTH, W. G. C. Carbohydrate metabolism in the soil. Chemistry & Industry [67] no. 33: 515-19 (Aug. 14, 1948).

The author considers the available information regarding the carbohydrates present, their formation, decomposition, and function in soil. A wide range of organisms has been found capable of attacking cellulose, which plays an important role as an energy source for the soil microorganisms. In general, the hemicelluloses are even more readily attacked by soil organisms. A determination of the relative rates of decomposition of the different cellulosans and polyuronide hemicelluloses is needed. It appears that soil carbohydrates may be derived from the polyuronide hemicellulose fraction of plants or by microbial synthesis. The author claims to have found three types of polysaccharides from soil bacteria: levans, glucose-uronics, and glucose-mannose-uronics, all of which might contribute to soil organic matter. 58 references. R.R.

CELLULOSE—OXYCELLULOSE

MCGEE, P. A., FOWLER, W. F., JR., UNRUH, C. C., and KENYON, W. O. Investigation of the properties of cellulose oxidized by nitrogen dioxide. VI. The effect of alkali on the celluronic acids. J. Am. Chem. Soc. 70, no. 8: 2700-5 (August, 1948); *cf.* B.I.P.C. 17: 409.

Potentiometric investigations confirmed the fact that, when celluronic acids are subjected to the action of dilute alkali, they are degraded with the generation of more acidity. No correlation has been found between extra acidity generated at high pH and nitrogen content of the sample, nor does atmospheric oxygen appear to play a major role in the degradative process. Small amounts of carbonyl groups, in addition to carboxyl groups, have been detected in the celluronic acids. At a constant reaction time, the acidity generated in alkaline solution appears to be directly proportional to the carbonyl group contents. Since nitrogen tetroxide is known to react in a highly exothermic manner with aldehydes, whereas certain ketones do not react in this way, it is tentatively suggested that ketone groups may be present in celluronic acids. These groups are believed to enolize in alkali, the enediols split as in simple carbohydrates, the adjacent glucoside links hydrolyze, and an extensive alkaline degradation is thus initiated which continues along the chain and produces reducing and acidic substances. 20 footnotes. E.S.

CELLULOSE ESTERS—NITROCELLULOSE

SCHUR, MILTON O., and MCMURTRIE, DOUGLAS H. Nitration of wood pulp; influence of the physical condition of pulp and of the species of wood. Paper Trade J. 127, no. 13: 51-8 [T.S. 397-404] no. 14: 39-45 [T.S. 405-11] (Sept. 23, 30, 1948).

Among the important variables that influence the quality of nitrocellulose, cost, and smoothness of operation, are the form or physical condition of the cellulose at the time of nitration and the species of wood from which the pulp has been liberated. Experiments demonstrating the importance of both variables are described. Data obtained in the examination of a variety of coniferous wood pulps indicate that the behavior of a pulp in the acid wringer and of the beaten nitrocellulose in the poacher can

be predicted from a determination of the number of fibers of pulp per unit volume of test sheet—the lower the number, the more suitable the pulp. Since the number of fibers per gram of pulp and their resistance to packing are, mathematically expressed, functions of the cross sections of the fibers, the slenderness of the fibers of New England spruce and balsam fir—which contributes so greatly to their superiority as papermaking raw material—makes them less suitable as raw material for the nitrating industry than western hemlock or slash pine with fibers of relatively large cross sections. The beaten nitrocelluloses lend themselves more readily to dehydration in the press, the lower the number of fibers per gram of unnitrated pulp. The pulps were nitrated in three forms: as shreds, fluff, and split or flaked chips of dried board; of these, shreds were found to offer the most advantageous combination of yield, acid retention, and requirement of total acid content in the nitrating medium. Shreds were also relatively free from dust and submerged readily in mixed acid. Acid retention and rate of settling of beaten nitrocellulose were favorably affected if—in the purification of the wood pulp—sufficiently strong solutions of caustic soda were used to reduce the packing tendency of the fibers. 9 tables, 42 figures, and 28 references. E.S.

CELLULOSE FILMS, TRANSPARENT

PENN, W. S. The use of plastic films. Brit. Packer 10, no. 8: 17-18 (August, 1948).

In the first of a series of articles, in which will be considered the accomplishments in the field of plastic film packaging, the author discusses the plastics being used, the products so packaged, moisture-permeable plastics, and heat sealing. R.R.

CHEMICAL TESTING—CELLULOSE ESTERS

MALM, CARL J., TANGHE, LEO J., and LAIRD, BARBARA C. The determination of primary hydroxyl groups in cellulose acetate by tosylation and iodination. J. Am. Chem. Soc. 70, no. 8: 2740-7 (August, 1948); *cf.* B.I.P.C. 10: 153; 12: 391.

The method of tosylation and iodination used by Purves and co-workers was not found to give exact results in the determination of primary hydroxyl in cellulose and cellulose acetate; as the reaction conditions in both the tosylation and iodination were extended, increasing amounts of primary hydroxyl were indicated. In view of these difficulties, the reaction conditions must be standardized in comparing the amounts of primary hydroxyl in different samples of cellulose acetate. Different proportions of primary hydroxyl were found in samples of cellulose acetate depending on their methods of preparation. The introduction of slightly more than one iodine per glucose unit into tosylated cellulose indicated a slow participation of secondary hydroxyl in the tosylation-iodination reaction. 20 footnotes. E.S.

CHEMICAL TESTING—WOOD—MANNAN

WISE, LOUIS E., RATLIFF, EVELYN K., and BROWNING, B. L. Determination of mannose. Mannans in hardwoods. Anal. Chem. 20, no. 9: 825-8 (September, 1948); *cf.* B.I.P.C. 6: 383-4.

The Hägglund-Bratt method for the determination of mannose and mannans in wood was examined critically, modified, and applied to four hardwoods, all of which were shown to contain small amounts of mannan. In at least one case (aspen), it was shown that mannose units were present

in hardwood α-cellulose. Cotton linters, on hydrolysis, gave no mannose. 25 references. E.S.

CHLORINE

JOHNSTONE, H. F. Chlorine production; nonelectrolytic processes. Chem. Eng. Progress 44, no. 9: 657-68 (September, 1948).

From an economic standpoint it is desirable to divorce the manufacture of caustic and chlorine, the two important basic chemicals coproduced in the electrolytic process. Demand for caustic at present actually exceeds that produced with chlorine, but there is evidence that the market for chlorine will continue to expand even beyond that needed at the peak of the war effort. An appraisal is given of various nonelectrolytic processes, with estimates on the sulfur trioxide-salt processes, the chlorosulfonic process, and the oxidation of hydrogen chloride using pure oxygen. Improvements in oxidation of hydrogen chloride (Air Reduction Co. process and the I. G. Farbenindustrie process) are described. The prospects for tonnage oxygen at relatively low cost and the developments of new catalysts and absorbents make chlorine manufacture by oxidation of hydrogen chloride the most attractive for nonelectrolytic chlorine, especially when by-product hydrogen chloride is available. The German process is claimed to compete in cost with electrolytic processes for plants producing 50 tons or more of chlorine daily. 12 figures, including flowsheets of the processes discussed, and 54 references. E.S.

CHROMATOGRAPHY

CONSDEN, R. Partition chromatography on paper, its scope and application. Nature 162, no. 4114: 359-61 (Sept. 4, 1948).

The author reviews the uses of partition chromatography on paper. He emphasizes that preliminary separations may often be necessary before paper chromatography can be used most advantageously, because mixtures may be very complex. 51 references. R.R.

CLAY

MILLMAN, N. Brightness determination of paper clays. Paper Trade J. 127, no. 13: 43-5 (Sept. 23, 1948).

It has been determined that a clay brightness evaluation depends largely upon the preparation of the specimen preliminary to testing to insure reproducible results in different laboratories. The author discusses the effect of various factors (degree and uniformity of comminution, moisture, and pressure used in forming a testing surface) on the reflectance of clay and describes a method which involves the preparation of the clay specimen under standardized conditions. E.S.

CONTAINER INDUSTRY

BETTENDORF, HARRY J. Statistical summary of paperboard group of industries. Fibre Containers 33, no. 8: 86, 88, 90, 93-4, 96, 101-2, 104, 106, 108, 113-14 (August, 1948); *cf.* B.I.P.C. 18: 87.

This initial summary—intended to bring together the principal developments in the past and possible future trends—covers the following: today's general trends and problems, fibrous raw materials general trends, details on fibrous raw materials, broad growth of board and containers, and relative growth of board and paper. The separate sections of the paper-

board group (statistics for waste paper, pulpwood and wood pulp, fiber boxes, folding boxes, etc.) are discussed under their individual headings and in separate articles. The number of containers used in 1947 amounted to 96,800,000,000 equivalent to about 265,343,000 containers per day or to 1.8 containers per day for every man, woman, and child in the country. Of this total, the number of folding boxes used per day in 1947 accounts for 223,500,000; of setup boxes, for 17,500,000; of fiber cans and tubes, for 7,200,000; of fiber drums and pails, for 43,000; and of corrugated and solid fiber boxes, for 17,100,000. With a balancing of supply and demand in the paperboard field, there has been a noticeable improvement in the quality of paperboard boxes. With new kraft board machines coming into production, several jute mills in the North have become idle; this trend would be still more pronounced if the limited wood supply did not limit the construction of further kraft mills. Under present conditions, it is likely that the well-equipped jute mills may be called upon to supply expanded demands for container boards in future years. Container board for corrugated and solid fiber boxes forms by far the largest segment of paperboard usage (47.2%), followed by folding boxboard (21.4%), miscellaneous board (13.1%), building board (11.7%), setup boxboard (5.8%), and cardboard and wet machine board forming but small segments of the total production. Taking the year 1929 as a basis, shipping containers have increased by 244.4% and folding boxes by 236.5% in 1947, whereas setup boxes have decreased to 91.4% of the 1929 volume. Numerous tables and diagrams with statistical information are included, the majority of the data going back to 1929, a few presenting representative years from 1859 to date. The greatest growth in the past 18 years has occurred in connection with paperboard, that of paper being much smaller. In 1947, the paperboard volume was nearly 1300 times that of 1859, whereas the paper volume was only about 90 times larger. E.S.

COOKING PROCESS

RICHTER, JOHAN. Continuous pulp cooking. Finnish Paper Timber J. 30, no. 15: 257-60; no. 16: 269-72, 275 (Aug. 15, 31, 1948). [In Finnish; English summary]

An illustrated description is given of the process for the continuous cooking of pulp, as developed in Sweden by the A. B. Kamyr. So far, it has been applied to sulfate cooking only; however, the Mo och Domsjö A. B. are erecting a pilot plant for sulfite pulp. Four mills are under construction in Italy, France, and Sweden, which will utilize this new cooking method; others are planned (*cf.* Canadian patents 451,018 and 451,019, p. 131). E.S.

CORROSION

ANON. Rust prevention in packaging. PATRA J. 11, no. 1: 18-19 (January, 1948). [Confidential to members of PATRA] *cf.* B.I.P.C. 18: 830.

Of interest to packagers and printers is the discovery that the corrosion of steel and some other metals under humid conditions can be prevented by wrapping them in paper impregnated with a 5% solution of sodium benzoate. The various benzoic acid esters are similarly effective in vapor form when they are used to impregnate paper. The chloride content of the paper should not exceed 0.1% by weight. The use of such material may result in the development of wire-stitched boxes and books, paper labels for tins, and simple packing for metal articles, which will not be disfigured by rust stains. R.R.

ELLINGER, G. A., WALDRON, L. J., and MARZOLF, S. B. Laboratory corrosion tests of iron and steel pipes. Paper Trade J. 127, no. 10: 27-32 (Sept. 2, 1948).

Continuous flow laboratory corrosion tests of ten types of uncoated ferrous pipes were made over periods of time extending up to ten years. The corroding medium was Washington, D.C., tap water continuously circulated through columns of the test samples. The corrosion was measured as loss of weight and depth of pits in relation to the time of exposure. A low-alloy steel had the highest corrosion rate, whereas a copper-molybdenum-ingot iron and a nickel-bearing wrought iron had the lowest; other samples corroded at intermediate rates. Since all the materials were tested in the uncoated condition, the pipes contained considerable corrosion products at the end of the test, which decreased their hydraulic efficiencies to a considerable extent. Estimated roughly from these tests, the minimum length of life of these bare materials, when subjected to continuous flow of Washington, D.C., water, would be about 15 years. The laboratory-controlled tests indicated corrosion rates about twice as great as those in service lines where the flow of water is only intermittent and not continuous. E.S.

FERMENTATION PROCESS

MARSTON, H. R. The fermentation of cellulose *in vitro* by organisms from the rumen of sheep. Biochem. J. 42, no. 4: 564-74 (1948).

Under environmental conditions similar to those in the normal rumen, cellulose—when fermented *in vitro* by associative growths of micro-organisms separated from actively fermenting rumen contents—yielded acetic acid, propionic acid, carbon dioxide, and methane as main products, together with smaller quantities of formic and butyric acids, and traces of acetaldehyde, pyruvic acid, and lactic acid. Propionic acid predominated among the dissimilation products. Depending on the duration of the fermentation, the amount of combustible energy in the micro-organism which proliferated ranged between 7 and 16% of that of the cellulose fermented. The usefulness of the fermentation products as sources of energy to the animal are discussed. 68 references. E.S.

SILCOX, HERBERT E., and LEE, SYLVAN B. Fermentation. Ind. Eng. Chem. 40, no. 9: 1602-8 (September, 1948).

Fermentation as a unit process is reviewed in the present article, including references on the production of alcohol and yeast from sulfite waste liquor. 109 references. E.S.

FIBER—STRUCTURE

TREITEL, OTTO. Elasticity, plasticity, and compression for cylindrical plant tissues, and fine structure of their cell walls. J. Colloid Sci. 3, no. 3: 263-71 (June, 1948); *cf.* B.I.P.C. 17: 623.

There are two systems of elastic and plastic values which are related to the submicroscopic structure of cylindrical tissues of higher plants. In the first system, the structure is related to the longitudinal Young's modulus, to the transverse modulus of elasticity, and to the transverse coefficient of plasticity with respect to bending (*cf.* B.I.P.C. 17: 168-9). In the second system, the structure is related to the longitudinal Young's modulus, to the transverse modulus of compression, and to the transverse coefficient of plasticity with respect to compression, when the elastic and

plastic values are defined for a pile of cylindrical plant tissues. A technique is described by which the transverse modulus of compression of rubber-like cylindrical plant tissues may be measured. It is shown that the stipes of *Laminaria agardhii,* petioles of *Nymphaea gladstonia,* and stems of *Brasenia schreberi* have the same small transverse modulus of compression—0.1×10^8 g./sq.cm. This low value is probably indicative of weak van der Waals forces acting through a considerable distance and it supports the theory that, for rubber-like elastic cylindrical plant tissues, there is weakness in the transverse direction. Elasticity, plasticity, and submicroscopic structure of average secondary cell walls in rubber-like elastic cylindrical plant tissues are closely related to each other, because these tissues have the same elasticity-plasticity equation. The distinction between the stress-strain curves of living cylindrical tissues of higher plants and the stress-strain curves of dead metallic rods is pointed out and these curves are related to the amount of crystalline and amorphous cellulose in the secondary wall. Death occurs in plants if the ratio of crystalline to amorphous cellulose becomes too great or if the ratio of the longitudinal and the transverse modulus of elasticity becomes too great. J.W.S.

FIBER—TESTING

GRANT, JAMES N., and MORLIER, ORA W. Relation of specific strength of cotton fibers to fiber length and testing method. Textile Research J. 18, no. 8: 481-7 (August, 1948).

Four cottons in commercial production, covering a range of such physical properties as strength, length, and fineness, were studied in a comparison of two methods of determining fiber strength—the individual fiber test and the Pressley flat-bundle test. Because of the combing action in bundle preparation, cotton fibers broken in the flat-bundle test represent the longer fibers found in a sample of cotton. These remaining fibers are not representative of the length of the original sample nor, since fiber specific strength increases with fiber length, are they representative of the strength of the original sample. This increase in specific strength with increase in length is evident whether fibers are broken individually or in aggregates. The relationship between the logarithm of individual fiber tensile strength and the logarithm of the specimen length used is inversely linear. The flat-bundle test represents the strength of fibers whose specimen lengths were deduced to be between 1/16 and 3/32 inch. 12 references. E.S.

FIRE PREVENTION

STREPP, HG. Wet water used in fire fighting. Wochbl. Papierfabr. 76, no. 6: 141-2 (June, 1948). [In German] *cf.* B.I.P.C. 18: 558-9.

The use of water containing surface active agents is advocated for combating straw, paper, sawdust, heavy paraffin, and transformer oil fires. It cannot be used in the case of gasoline fires or those involving live electrical equipment. L.E.W.

FOLDING BOXES

LILLIE, A. R., and BETTENDORF, HARRY J. Folding box industry statistics. Fibre Containers 33, no. 8: 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180 (August, 1948); *cf.* B.I.P.C. 18: 89-90.

Using the same classifications with regard to end use as last year, with one exception, the authors discuss the growth of the industry in tons, by number of employees, man-hours, and payroll, again stressing the relative stability of the industry. Numerous tabulated data, graphs, and a map

showing folding-box zones in the United States are included, most data taking the year 1936 as a basis. E.S.

FOREST FIRES

ANON. Fire protection in Florida. Pulp & Paper 22, no. 10: 74, 76, 78, 80, 82 (September, 1948).

An illustrated description is given of the intensive fire protection program of the St. Joe Paper Co. at Port St. Joe, Fla. The company owns in excess of 800,000 acres of southern forest land, chiefly longleaf and slash pine, and also a large area of hardwoods. The bulk of the company lands is divided into five district units along natural geographical lines, each district being placed in charge of an experienced forester, backed by a competent working force. Each district functions in close harmony with the fire control system of Florida's Forest Service. The organization of the company's protective services and the equipment used are described. E.S.

WOOLLEY, ROI B. Some lessons taught by the New England fire disaster. Pulp Paper Mag. Can. 49, no. 9: 109-12 (August, 1948).

If the New England forest fires in the fall of 1947 taught anything, it is that forest and field fire control must take into consideration the weather—at least the factors of temperatures, precipitation, wind, and humidity. Large open fires create their own gales and many factors (amount and extent of burnable material, terrain, wind and other breaks, etc.) influence both wind velocity and its direction. Recommendations are offered for the future: better preparedness, co-ordination of effort, mutual help, communications, legal factors, manpower for efficient fire fighting, equipment, and training and direction. In some of the areas, wet water (i.e., water containing a surface-active agent [*cf.* B.I.P.C. 18: 558]) was used for the first time on a large-scale operation, although no complete reports on its effectiveness have yet been released. E.S.

FORESTS AND FORESTRY

BASER, NORT. The tree farm's place in the Texas forestry program. Paper Trade J. 127, no. 12: 43-4 (Sept. 16, 1948).

A brief outline is given of the nature and scope of the Texas tree farm system, which was initiated in 1944 and which is guided by the Texas Forest Service, the Texas Forestry Association, and the East Texas Chamber of Commerce. The purpose of the program is the perpetuation of the state's supply of timber by encouraging sound forestry practices. E.S.

PEEDE, LORING G. Rebuilding its extensive forests will fortify N.E. paper industry. Paper & Paper Products 89, no. 24: 1, 6-7 (Sept. 5, 1948).

Wood pulp capacity in New England has advanced steadily but slowly in recent years. The 1948 capacity is 1,667,964 tons, compared with 1,487,052 tons for 1939. Groundwood production will total 779,200 tons this year, sulfite 561,559 tons, and soda pulp 173,070 tons, with the remainder accounted for by sulfate and semichemical pulps. A report made by the Northeastern Wood Utilization Council reveals that the economy of New England depends on her forests, most of them consisting of commercially good woods. The dangers arising from the budworm, gypsy moth, chestnut blight, and blister rust are even greater than those from fire. With good management, farm wood lots (comprising 22% of the privately owned forest land) and

the large holdings of nonfarmers (39% of the privately owned total), an amount equal to the holdings of paper and lumber companies, will help take care of most saw timber requirements and take the competitive pressure off pulpwood cutting. Because timber holdings are divided among so many people, the job of educating them in good forest management will be a great one. In spite of being the most extensively forested region in the country, New England produced only about 1,800,000 cords of the estimated annual total of 2,300,000, importing the remainder from Canada. R.R.

FURFURAL

HITCHCOCK, LAUREN B. Industrial development of furfural. Can. Chem. Process Inds. 32, no. 8: 718-24 (August, 1948).

The author reviews the industrial applications of furfural during the 26 years it has been on the market, including those of its derivatives, the furans. Its substantial growth during this time was primarily caused by its unique selective solvent properties, such as applied to the refining of petroleum, wood, rosin, vegetable oil, and butadiene, acetic acid recovery, etc. Whereas the solvent uses continue to grow, certain processes employing furfural as a chemical raw material are reaching commercial proportions such that their total requirements for furfural will exceed all other uses. Although the list of such chemical applications is a long one, the three types which account for the largest volume are hydrogenation derivatives, synthetic resins, and nylon intermediates, each of these three groups being discussed briefly. 18 references. E.S.

HITCHCOCK, LAUREN B., and DUFFEY, HOMER R. Commercial production of furfural in its twenty-fifth year. Chem. Eng. Progress 44, no. 9: 669-74 (September, 1948).

The authors review the market development of furfural and give a detailed illustrated description of the present Quaker process, as carried out at the Memphis, Tenn., plant, which was operated by the Quaker Oats Co. for Rubber Reserve since July, 1943 and bought by the company in November, 1946. A flowsheet of the process is included. The chief raw material is corncobs, although rice hulls are also being studied, even if their low furfural content does not make them attractive as a major source. The development of a reliable low-cost method for the collection and handling of cobs has been the major problem in their use. The solid residue leaving the digesters can be burned to supply steam for general plant requirements. However, furnaces of special design must be employed and careful preparation of the material is required. Research is being directed to find more valuable uses for this residue. In conclusion, data on the most economical plant size and properties of furfural are given. Uses are reviewed briefly, with particular reference to the production of adiponitrile, an intermediate in the preparation of nylon. 23 references. E.S.

GROUNDWOOD PULP

BADE, OTTO M. Chemical treatment of groundwood pulp for preventing damage by molds. Norsk Skogindustri 2, no. 8: 233-7 (August, 1948). [In Norwegian; English summary] *cf.* B.I.P.C. 11: 316.

Earlier investigations at the Norwegian Pulp and Paper Research Institute for controlling damages caused by fungi in wet groundwood pulp have been continued. Details are given of tests with the following five chemicals: Fibrosan, Lignasan, Pulpasan, Puratized SC, and Santobrite.

The chemicals were added in two different concentrations, corresponding to a cost of Norwegian crowns 2.00 and 5.00/ton of 50% airdry pulp. The effect of these five chemicals on rot and mildew was very satisfactory when added in the higher concentration. When the lower concentration was used, the results were still quite good, although not to the same extent as with the higher concentration. Serious objections, however, must be raised against the use of these chemicals from other viewpoints. Santobrite, which is a phenolic compound, has an objectionable odor and can, therefore, not be used in pulp. The ethyl mercury compounds, to which Fibrosan, Pulpasan, and Lignasan belong, are too toxic for use in groundwood mills. The most promising compounds seem to be those of the organic phenyl mercury group, to which Puratized SC belongs. Other compounds of this type are produced in America as well as in Europe. Before practical use, however, further experiments ought to be carried out; the co-operation with health and fishery authorities is indicated and recommended. E.S.

GADD, G. O. The moisture content of groundwood pulp and the danger of fungal infections. Norsk Skogindustri 2, no. 7: 179-82 (July, 1948). [In Swedish; English summary] *cf.* B.I.P.C. 18: 752-3.

This article is complementary to the previous reference and discusses the problem from the angle of the microbiologist. Investigations carried out at the A.B. Centrallaboratorium O.Y. in Helsingfors, Finland, showed that mechanical pulp, when dried uniformly to 75% ovendry, does not mold during subsequent shipment and storage. When dried to 70% only, the development of fungal growth is greatly retarded. At dryness percentages lower than 70%, a prolific growth develops, apparently because the air between the individual pulp layers in a bale has a relative humidity of 100%. Provided that the drying process is carried out under carefully controlled conditions (30% R.H. and 85° C.), the strength properties of the pulp are but little affected, corresponding to a maximum decrease of 3%, whereas the folding endurance is liable to decrease to a much greater extent. Repulping and defibering of the dried sheets became increasingly more difficult, the higher the dryness percentages were over 70%. After a six months' storage period, all samples—including airdry pulp—had changed to such an extent that defibering required more time than prior to storage. Moist pulp, if penetrated by the hyphae of the molds during storage, may also become more difficult to defibrate than the noninfected dry or halfdry pulp. However, the extent to which the repulping rate is retarded is not the same for all organisms, although no specific investigations of this behavior have yet been made. E.S.

HEATING

JENKINS, J. H. Use of wood for heating logging camps. Pulp Paper Mag. Can. 49, no. 9: 114, 116, 118, 120, 122, 124, 126, 128 (August, 1948).

The present study was undertaken in an effort to determine how the heating of logging camps, primarily in Eastern Canada, can be efficiently improved. Wood will in all probability continue as the paramount fuel in camps; however, there is a big field for improvement in the use of this fuel. Little attention has been paid thus far to the design of a heating system to meet the requirements of the camp building, with the result that the small insulated building is overheated, and the large bunk house exhibits an uneven distribution of temperature throughout the building, being either too cold or too hot, depending upon the proximity of the stove. Moreover, a large amount of labor and dirt is involved in maintaining fires throughout the 24-hour day. Research is necessary regarding the economics of

various sizes and types of camp buildings, insulated and uninsulated, and regarding the feasibility and economics of improved heating systems and of using wood fuel in some other form than firewood, such as sawdust or hogged fuel. A review of background material is presented and recommendations for future studies are given. E.S.

REID, J. C. Electric heat offers many advantages in the manufacture of asphalt roofing. Pulp Paper Mag. Can. 49, no. 9: 75-8 (August, 1948).

An illustrated description is given of the new electric heating equipment at the roofing plant of Bishop Asphalt Papers Limited, Portneuf Station, Que., which went into operation in 1947. The process is a continuous one. The felt, after receiving an initial spray, passes successively on a system of rolls through the saturating tank, coating tank, and under the granule applicator through the cooling rolls onto the winder or the shingle cutter. Electric heating equipment was provided for the six principal heating processes: three holding storage tanks, where the asphalt is maintained at a sufficiently high temperature to permit pumping; five heating stills in which the temperature is raised to the working range; one large saturating tank through which the heated asphalt is continuously circulated; one coating tank or pan over which the impregnated felt is passed between two heated coating rolls; all rolls on the saturator not immersed in the saturant and all rolls on the coater; and all pumps, valves, and asphalt lines. The individual installations are described. Expectations have been met in every respect. The advantages of the heating system include: a minimum of carbonization and consequent increased life of equipment, greatly enhanced safety on account of removal of fire risk, accurate temperature control, and lower over-all production cost. E.S.

HEATING (INFRARED)

HOELTZEL, O. R., and LYONS, E. L. Infrared gas heat to increase roofing felt production. Southern Pulp Paper Manuf. 11, no. 5: 56-7, 64 (May, 1948).

An illustrated description is given of the installation of infrared gas burners between the last press and the first drier of a machine making roofing felt. Two 77-inch burners were placed above, and three 77-inch burners below the sheet, at a distance of approximately 4 inches from the sheet. A common air and gas source was used with a single electrical control; however, each burner was provided with separate pilot lights and burner adjustment controls. An average production increase of 14% resulted; it is pointed out that the equipment consumes a considerable quantity of gas per hour and can probably be utilized to advantage only when gas rates are satisfactory. E.S.

HUMIDITY

MILL, C. C., and POULTER, S. R. C. Vapour pressures and humidities of saturated salt solutions. PATRA J. 11, no. 1: 17 (January, 1948). [Confidential to members of PATRA] *cf.* B.I.P.C. 16: 454-5.

Data are tabulated on the vapor pressures and relative humidities of various saturated salt solutions at 20° and 25° C. The measurements were made *in vacuo* by means of a mercury manometer, four determinations being made on each salt; the maximum deviation from the mean was 0.2 mm., about 1% relative humidity. The results are in fair agreement with those given in the earlier reference. R.R.

INSTRUMENTATION

CHANDLER, JOHN B. Instrumentation for the sulphite mill. Southern Pulp Paper Manuf. 11, no. 9: 23-4, 26, 28, 68 (September, 1948).

The author discusses the application of instruments to the acid plant under the headings: sulfur melting, sulfur dioxide production, gas cooling, raw acid making, and recovery system. Diagrams and illustrations are included. The author emphasizes that he made every effort to refrain from recommending superfluous instruments, his experience being that too many instruments are nearly as bad as too few. E.S.

LIGNIN

LAHEY, F. N., and MEREWETHER, J. W. T. Studies on the lignin of *Eucalyptus regnans*. I. Thiolignin. Australian J. Sci. Research 1A, no. 1: 112-19 (March, 1948).

Ahlm (*cf.* B.I.P.C. 12: 44) prepared a series of derivatives from a carefully purified spruce thiolignin. Since hardwood lignin differs from softwood lignin, the object of the present paper was to obtain information on the nature of lignin isolated from the black liquor of a *E. regnans* sulfate cook. A thiolignin in pure state was prepared by acidifying the black liquor and fractionating the product. Thiolignin reacts with diazomethane to yield a trimethyl derivative, and with dimethyl sulfate to yield a hexamethyl derivative. Thiolignin, trimethylthiolignin, and hexamethylthiolignin react with acetic anhydride in pyridine to yield, respectively, hepta-, tetra-, and monoacetyl derivatives. The data obtained are consistent with the formula: $C_{82}H_{35}O_{10}.(OCH_3)_9.C(CH_3)OH.(CHOH)_2.CH=C(OH).OH.SH$. 13 references. E.S.

RUSSELL, ALFRED. Interpretation of lignin. II. The synthesis of further analogs of spruce lignin. J. Am. Chem. Soc. 70, no. 9: 2864-5 (September, 1948); *cf.* B.I.P.C. 18: 597.

The polymerization reaction used in the synthesis from vanillin of a polymeric material having the structure proposed for spruce lignin has been extended to the preparation of analogous polymeric materials from *o*- and *p*-hydroxybenzaldehydes. E.S.

WACEK, A. v. and KRATZL, K. Constitution of the side chains of lignin. J. Polymer Sci. 3, no. 4: 539-48 (August, 1948). [In English; French and German summaries] *cf.* B.I.P.C. 18: 838.

The evidence for the nature of the side chains in lignin resulting from investigations of the reactions of model substances (published in a number of articles by the authors in German periodicals) is summarized. The studies have involved investigations of the reactions of model substances with sulfite, alkali and nitrobenzene, and hot alkali. Reaction with sulfite occurs readily for model substances with β-hydroxyl or α, β-unsaturated keto groupings (aldol type). Hydroxyl groups adjacent to a ring are somewhat reactive, but α-hydroxyketo groupings (acyloin type) do not react. Alkaline oxidation to aldehyde or carboxyl with nitrobenzene is effective in degrading a side chain *para* to a free hydroxyl group having an oxygen atom on the α-carbon atom. Conversion of the *p*-phenolic hydroxyl to a methyl ether neutralizes its promoting influence. Cleavage to an aldehyde with hot alkali in the absence of air is specific for the aldol-type grouping in the side chain. This is regarded as a reverse aldol condensation, and it has been demonstrated that acetaldehyde can be isolated from such degradations.

These results, together with the behavior of lignin and its derivatives, are interpreted in terms of probable structures of the side-chain units in lignin. 30 references. E.S.

MACHINERY

CHEMICAL INDUSTRIES. Equipment manufacturers satisfy expansion demands. Chem. Industries 63, no. 3: 400-19, 476, 478, 493, 542 (September, 1948).

A discussion is presented of new types of equipment, with a list of such equipment announced during 1947-8 as follows: adsorbers, p. 406; auxiliaries, p. 404-5; centrifuges, p. 407; distillation and extraction, p. 408; dust and liquid separation, p. 405; evaporators, p. 409; grinding, p. 414; heat exchange, p. 405-6; instrumentation and process control, p. 410-14; materials handling, p. 414-16; mixers, p. 403-4; pipe and fittings, p. 416-19; pumps, compressors, and expanders, p. 408-9; safety, p. 406-7; solid separation, p. 409-10; and manufacturers' addresses, p. 476, 478, 493, 542. The information given includes type of equipment, sizes, construction materials, distinguishing features, applications and limitations, and manufacturer. R.R.

HASKELL, J. D. Stock preparation trends. Paper Mill News 71, no. 36: 12-13, 16 (Sept. 4, 1948).

The author discusses the advantages of so-called "packaged unit" stock preparation machinery, where the whole system of slushing, refining, blending, and cutting or shortening of the fibers is tied together with remote controls, so that the operator can control any or all equipment from one central control panel. The arrangement may involve Hydrapulpers, Hydrafiners, Hydracycle systems, jordans, Agi-Flo pumps, Classifiner and Selectifier screens, etc., in different combinations, with a definite trend toward the use of continuous stock preparation equipment in the place of batch treatment. The application to mills making fine, medium, and coarse paper grades is outlined. As a culmination of this trend, the ultimate extinction of the old-fashioned beater may be anticipated. E.S.

JAATINEN, BIRGER. Report about America. Finnish Paper Timber J. 30, no. 12: 205-8; no. 13: 224-7 (July 15, 30, 1948). [In Swedish]

In giving his impressions of notable developments in the American pulp and paper industry, the author pays particular attention to high-speed refiners and stock preparation systems, including illustrations and flowsheets. E.S.

THE RUST ENGINEERING COMPANY, *Pittsburgh, Pa.* Pulp and paper mills design influenced by process development. Southern Pulp Paper Manuf. 11, no. 9: 64-5 (September, 1948).

New production methods which have had the most notable effect on design of paper mills are: installations of blow tanks and washers in place of diffusers; precipitators and evaporators to extract chemicals from flue gases; more mechanization of wood handling systems; new kraft bleach facilities; and improvements in lime calcining. Reference is made to projects and installations carried out by the company along these lines. E.S.

MACHINERY—BEARINGS

FAFNIR BEARING COMPANY, *New Britain, Conn.* Do's and dont's for using antifriction bearings. Paper Mill News 71, no. 35: 82, 84 (Aug. 28, 1948).

Dirt is responsible for most antifriction bearing failures. The bearings should not be unpacked until absolutely necessary and should be handled only with clean dry hands, clean tools, and preferably on a bench covered with clean paper. Suggestions are given for their installation, removal, and cleaning. R.R.

MACHINERY—BOARD MACHINES

ANON. Velocity Steam and increased productivity. Paper Mill News 71, no. 39: 62, 64, 66 (Sept. 25, 1948); *cf.* B.I.P.C. 18: 525.

Since the introduction of Velocity Steam (the trade-mark of a patented method for increasing heat transfer from steam), corrugating equipment speeds have increased from 275 to over 400 ft./min.; the speed of equipment producing 350- to 600-test double-wall boards has increased from 240 and 110 to 300 ft./min. The pulsating flow of steam through drying equipment and the integrated control of return flow by the heat load on the system account for this increased production capacity. A discussion of these principles is supplemented by diagrams of a typical installation and of a master control unit. Several installations are described and the improvements reported. R.R.

MACHINERY—CALENDERS

FARREL-BIRMINGHAM COMPANY, INC., *Ansonia, Conn.* Care of calenders and calender rolls. Paper Mill News 71, no. 35: 54, 56 (Aug. 28, 1948).

Calender stacks should give little cause for concern if they are frequently inspected, the rolls properly reground when marked, and common sense precautions used. Suggestions are included regarding regular inspection, pitting or rusting, the correct crown shape of the rolls, and doctors and rolls. The material in the article is taken from a pamphlet on the care of calenders and calender rolls issued by the Farrel-Birmingham Co., Inc. R.R.

THOMAS, E. E. Modern high speed supercalendering. Paper Mill News 71, no. 37: 12, 14 (Sept. 11, 1948); *cf.* B.I.P.C. 16: 450.

As in the previous reference, the author deals with the fundamentals involving calendering action and correlates them with coated paper properties. The four variables essential to polishing, smoothing, or obtaining gloss on the surface of paper are pressure, plastic flow, speed, and temperature, all of which are confined within a small area, the nip or nips. The only physical difference between calender and supercalender is the substitution of inert metal rolls in the former by filled rolls made of a more or less resilient material possessing plastic flow properties. This latter condition is the chief factor responsible for the effectiveness of a supercalender in producing higher degrees of gloss and smoothness. The influence of pressure, plastic flow, speed, and temperature upon the resulting coated paper are described, with particular reference to the need for controlling the temperature of the rolls. E.S.

MACHINERY—CONVERTING MACHINERY

ANON. Hershey's box seal. Modern Packaging 22, no. 1: 136-9 (September, 1948).

A thermoplastic roll-type label is being used by the Hershey Chocolate Corp. as a tamperproof seal for boxes of candy. Machines are used which cut labels, position them on each side of the box base, fold them over the side, and heat seal them in one continuous operation, running at a

speed of 75 boxes per minute. The boxes have been changed to a full-telescope two-piece box of coated 0.021-inch board. The inventory and storage problems have been simplified and the removal of machinery no longer needed has provided space for additional bar wrapping machines. A description is given of the packaging line and the new labeling machine. R.R.

SAMUEL M. LANGSTON COMPANY, *Camden, N.J.* Some recent developments in corrugated box machinery. Paper Mill News 71, no. 39: 68-70 (Sept. 25, 1948).

To meet the increased demand for corrugated boxes and yet keep up the quality of the product, it was found necessary to apply more and better controlled heat to the paper; to use better conditioned paper for corrugating and gluing to the corrugated sheet; and to facilitate the moving of paper rolls, because new rolls had to be put in place more often with increased speed. To meet these demands, Langston has produced three machines: a 36-inch diameter liner preheater, a preconditioning and tensioning device, and a shaftless mill roll stand. Each of these machines is described and illustrated. R.R.

JOHN WALDRON CORPORATION, *New Brunswick, N.J.* Waldron building converting machinery for over a century. Paper Mill News 71, no. 39: 52, 54 (Sept. 25, 1948).

Brief consideration is given to the following types of Waldron converting machines: reverse roll coating, surface printing, embossing, laminating, waxing, and sheet varnishing. Illustrations are included of all but the surface printing type. R.R.

MACHINERY—PACKAGING MACHINERY

ANON. Automatic packaging system using multi-wall paper bags for flour. Paper Mill News 71, no. 39: 81 (Sept. 25, 1948).

Four St. Regis 402-PS valve bag filling machines are now operating in the Toledo, Ohio, flour mill of the National Biscuit Co. Each packer has a capacity of about six 100-pound bags a minute, and drops the bags on a single conveyer belt which carries them to the railroad car on a siding adjacent the mill. The company is using similar equipment in another mill, and has ordered more for a third installation. This system illustrates the marked increase in the use of multiwall paper valve bags. R.R.

MACHINERY—PAPER MACHINE

LAEMMERMANN, FRED W. Paper machine maintenance. Paper Mill News 71, no. 35: 28-9 (Aug. 28, 1948).

Under preventive maintenance, the first and most important item is proper lubrication, the first step being the selection of one or more intelligent conscientious persons to be responsible for all lubrication. A regular schedule of oiling should be set up from the manufacturers' data on the proper types of oil or grease and the frequency of lubrication. Another essential is regular and rigid inspection by a well-trained experienced maintenance crew with at least one experienced engineer in charge. Some of the important points for inspection are mentioned. Worn parts should be replaced as soon as possible, before they can damage other parts; replacements should always be on hand. When installing new parts, their effect on adjacent old parts must be watched carefully. R.R.

MACHINERY—PRINTING MACHINE

THE CHAMPLAIN COMPANY, *Bloomfield, N.J.* New aniline press designed for board converters and package printers. Packaging Parade 16, no. 188: 84 (September, 1948); Graphic Arts Monthly 20, no. 9: 140 (September, 1948); Paper Trade J. 127, no. 13: 49 (Sept. 23, 1948); Fibre Containers 33, no. 9: 95-6 (September, 1948); *cf.* B.I.P.C. 18: 842.

The new Champlain aniline press, especially designed for board converters and package printers, will deliver printed, die-cut, scored, and stripped cartons up to 600 ft./min. The roll-fed web can be printed on one or both sides in any number of colors; varnishing can be done in the same operation. When a plate change is necessary, only the printing cylinder need be removed. Push button register is standard equipment, although automatic electronic control may be added. A diagram of the press is included. R.R.

MACHINERY—PULPWOOD RAKE

RISLER, C. B. Handling facilities for pulpwood storage area. Paper Mill News 71, no. 36: 14, 16 (Sept. 4, 1948).

An illustrated description is given of the dragline rake system in use at the Bucksport Division of the St. Regis Paper Co. at Bucksport, Me., for reclaiming pulpwood from the storage pile. Problems involved in the original hoisting machinery and drive equipment are discussed, as well as improvements incorporated in a new design. E.S.

MACHINERY—REFINERS

ANON. Unusual use of Jones refiners. Pulp & Paper 22, no. 10: 90 (September, 1948).

As part of an over-all modernization program which included increasing production from 60 to 100 tons per day of various grades of board, the Carthage Paper Makers, Inc., Carthage, N.Y., has recently made an unusual refining installation. One Jones No. 1 high-speed refiner is connected with each of the machine's seven cylinders. The pulp is prepared in pulpers, sent through an efficient cleaning system into a gate box, and from there through the refiners into the screen headboxes, where dilution takes place, and then directly into the vats. By having a separate refiner for each cylinder, the maximum in control is attained. A diagram of the installation is included. E.S.

MACHINERY—SCREENS

BIRD MACHINE COMPANY. Helpful hints on the maintenance of clean paper—and the maintenance of machinery for dirt removal. Paper Mill News 71, no. 35: 41-2, 44 (Aug. 29, 1948).

Recommendations are made in regard to the general maintenance of clean paper and consideration is also given to paper screens, mechanical inspection, the care and handling of screen plates, the screen shower, the Bird self-cleaning shower pipe, the maintenance of a correct stock level in the screen and of correct screen shake, and the removal of screen tailings. R.R.

MACHINERY—SHOWERS

BROUGHTON, A. E. Oscillating type shower unit, vacuum control system. Paper Mill News 71, no. 35: 38 (Aug. 28, 1948).

The author discusses the advantages arising from the use of the Brough-

ton high pressure oscillating-type shower with cylindrical screens, dandy rolls, Fourdrinier wires, and extractor rolls. The equipment improves operating conditions markedly. The use of the Broughton unit vacuum control system as applied to Fourdrinier flat boxes obviates the use of a flat box vacuum pump, allows for graduated vacuum on the boxes, allows the hydration point to be placed safely farther down the sheet, and permits higher vacuum with safety and positively maintained lower vacuum. R.R.

MACHINERY—SLICE

LANG, RICHARD. Totally enclosed pressure slice for high speed paper machine. Pulp Paper Mag. Can. 49, no. 9: 81-3 (August, 1948); *cf.* B.I.P.C. 16: 451.

This is a condensed translation of the German article. E.S.

MACHINERY—VALVES

HENDRICKSON, R. A. How to maintain and repair gate and globe valves. Paper Mill News 71, no. 35: 52, 56 (Aug. 28, 1948); Modern Packaging 26, no. 2: 109-12 (October, 1948).

After valves have been properly selected and installed, their maintenance can be reduced surprisingly through periodic inspection. When valve leakage is disclosed, the trouble should be remedied immediately before the valve is damaged beyond repair. The author gives suggestions regarding stuffing box leaks, gasket leaks, repairs on globe and angle valves, and the replacement of composition disks in globe and angle valves. R.R.

MACHINERY—WAXING MACHINE

HASKELL, W. D. The Miami Lo-Type waxer. Paper Mill News 71, no. 39: 45-6, 48 (Sept. 25, 1948).

Basically, paper to be waxed is run through a bath of molten wax, passed through a set of two or three squeeze rolls which meter the wax on the sheet, then through a refrigerated water bath or over cooling rolls, and finally wound into rolls. Three types of waxing are considered: wet or surface waxing, typified by the bread wrap; dry waxing, of which the drinking cup is a typical example; and one-side waxing, which is used for locker paper. Dilts waxing machines are available for all types. In the Miami Lo-Type waxer for wet waxing, manufactured by the Dilts Machine Works, the application is by squeeze rolls, with speeds of 1500 feet per minute and wax applications as low as one pound per ream not uncommon. An illustrated description is given of the waxer and its water finish attachment. R.R.

MICROSCOPY

ARMITAGE, F. D. The microscope and its applications in the papermaking and printing industries. Part 5. An atlas of papermaking fibres. Paper Making 67, no. 2 (supplement): 1-31 (Summer, 1948); *cf.* B.I.P.C. 18: 765.

Because staining reactions alone may not be sufficient to indicate the identity of a papermaking fiber, the analyst should familiarize himself with the microscopical structure of the fibers. This atlas is given as a guide to the morphological characteristics of a number of papermaking fibers. Whenever possible, microscope slides should be made for comparative purposes, not only of unbeaten known fibers, but also of similar fibers after being subjected to all the stages of the papermaking process. An examination of the specimens in partially polarized light will help con-

siderably to reveal hidden structures and surface markings. When the routine examination of the specimen is completed, the various staining methods given in the previous reference may be employed to confirm the identity of the fibers. To aid in the identification of highly beaten fibers, a large number of slides should be prepared and examined; one fiber may contain a clue that is lacking in the others. A list is given of features which are to be looked for, and also an identification table for paper fibers, excluding synthetics. 28 photomicrographs. R.R.

MICROSCOPY (ELECTRON)

FARRANT, J. L., and HODGE, A. J. An interferometric method for the calibration of electron microscope magnification. J. Applied Phys. 19, no. 9: 840-4 (September, 1948).

Interferometric methods have been used to measure uniform cylindrical silica and glass fibers as small as 5μ in diameter with better than 1% accuracy. Such fibers yield sharp images when examined in the electron microscope and constitute a convenient and rugged specimen for accurate direct calibration of the instrument for magnifications up to 10,000 diameters. Higher magnification ranges are then readily determined by means of an internal calibration obtained by taking micrographs of glass spheres about 0.5μ in diameter. Such spheres are also convenient specimens for determining the image distortions which must be known to correct the widths of the fiber images. This method appears to be capable of greater accuracy than any employed hitherto. 13 references. E.S.

KINSINGER, WILLIAM G., and HOCK, CHARLES W. Electron microscopical studies of natural cellulose fibers. Ind. Eng. Chem. 40, no. 9: 1711-16 (September, 1948).

Three developments in the technique of preparing specimens for electron microscopy—metallic shadow casting, surface replicas, and electron stains—were applied to a study of the submicroscopic structure of natural cellulose fibers. The results of this investigation offer additional evidence in support of a fibrillate structure for natural cellulose. The coarse fibrils commonly observed by optical and electron microscopy are shown by metallic shadow casting to consist of still finer unit fibrils. Although the diameters of these fine fibrils vary somewhat in a single sample, greater differences in this respect prevail among fibers of different origins. Thus, the diameters of the fibrils in ramie, cotton, and wood pulp decrease in the order named. Similarly, variations in straightness and smoothness of the fibrils follow the same order. These differences suggest a correlation between the character of the fibrils and the physical and chemical properties of the fibers. Ramie, for example, is a highly crystalline, well-oriented fiber with marked tensile strength but with low elongation and poor reactivity. The properties of wood pulp fibers are in some respects opposite those of ramie, whereas cotton is, in general, intermediate. If the fibrils, in contrast to the interfibrillar regions, are more highly ordered, one would expect chemical reactions to proceed along the fibrillar surfaces before the fibrils themselves were attacked. The volume of interfibrillar cellulose is, of course, inversely proportional to the diameter of the fibrils. Other things being equal, reactivity should then correlate with fibril diameter. Some basis for the postulate may be found, for example, in hydrolysis studies where the accessibility to acid degradation is considered to be a measure of amorphous cellulose. It seems significant that the accessibility of ramie, cotton, and wood pulp correlates with the magnitude of their fibrillar surface. Neither the widths of the fibrils nor the lengthwise periodicity of approximately 150 A. observed after chromium shadowing and after electron staining corresponds to the

dimensions of submicroscopic structures determined by other methods. By x-ray diffraction, for example, the micelle is found to be about 50 A. wide and at least 500 A. long. As estimated from the degree of polymerization of hydrolyzed cellulose, the more highly ordered regions in cotton consist of 280 glucose units—i.e., approximately 1450 A. long. Following hydrolytic and oxidative breakdown of cotton and ramie cellulose, Husemann and Carnap found, in size distribution curves of the remaining fiber segments, a maximum at 2250 ± 250 A. All these figures must be resolved in any final picture of the small scale structure of cellulose. 37 references. E.S.

MILL MANAGEMENT

COOL, O. C. Sound labor relations . . . a practical approach. Paper Ind. 30, no. 6: 878, 880 (September, 1948).

In the absence of compelling factors (as, for instance, correcting some emergency situation), there are a number of ways to approach the problem of where to begin a labor relations program, such as the legal approach, union negotiations, the introduction of some basic change, etc. The author favors the human relations approach, born of a desire to unify and harmonize all elements of the plant. The factors of job security, significance as an individual, a chance to get ahead, fair-and-square compensation, and a formalized grievance procedure are discussed from that angle. E.S.

DRYDEN, C. LEE. Systematic operation of construction and maintenance departments. Paper Mill News 71, no. 35: 30-3, 35-6, 38 (Aug. 28, 1948).

Maintenance and construction forces must be organized with clearly marked lines of responsibility from management to the newest helper, operated according to plan, integrated by a system of operation, and furnished with forms and records. The author discusses organization charts, work order forms, schedule meetings, duties connected with various positions, and the progress of the reports as they are used during the day. The advantages are given of the systematic operation of construction and maintenance departments as suggested. R.R.

PAPER—MERCHANDISING

SHEAHAN, JOHN D. Plan your warehouse for increased profits. Am. Paper Converter 22, no. 9: 14, 35 (September, 1948).

The first step in planning warehouse requirements is a decision as to what level of stock (raw materials, semifinished, or finished products) is to be maintained at any location. Sales must be studied and forecast to permit a computation of the physical size of the stock of each item. Space must be planned to accommodate the maximum stock reasonably expected to be on hand at any one time. Account should be taken of the needs for bin and shelf stock and for sample stock so established as to expedite shipment and reduce order-filling time. The computation of aisle space is controlled by the materials handling equipment to be used, the volume of traffic anticipated in each area, and lot sizes to be stocked in terms of cubic and net square feet. The storage of small lots may be simplified by the use of racks built to accommodate pallets or by the reservation of two of the four warehousing directions in the "islands" for them. Generally speaking, bulk storage space should never be specifically allocated for the entire stock of an item. However, it may be desirable to reserve a given area for a certain type of classification of stock. Items in greatest demand should be placed near the point of use or shipment. Many companies are successfully concentrating all responsibility for physical distribution operations, ware-

housing, materials handling, traffic management, packing and packaging, stock records, and stock control in the hands of one top level executive. R.R.

PAPER—SHEET FORMATION

KLEIN, F. S. Effects of stuff preparation on formation in rag papers. Paper Trade J. 127, no. 12: 50-1 [T.S. 392-3] (Sept. 16, 1948).

Uniform formation is a prime characteristic of rag papers. A definite balance between fiber length and freeness appears necessary to maintain physical strength with clear formation. The most common stock preparation set-up in rag mills is the ordinary hollander beater with a jordan between chests; in some cases auxiliary jordans are used, and a less common practice is to jordan the stock directly to the paper machine. The present trend toward time reduction is having its effects upon beater and jordan tackle and the distribution of work or treatment given to the fiber by the different pieces of equipment. In most rag mills, stuff preparation control is neither very rigid nor distinct and evaluation methods vary from mill to mill. Since stock preparation is a vital factor in formation (accounting for about 75% of this property), the need for better methods of evaluating the "work done on the fiber" is stressed. The length-freeness relationship is controlled in stuff preparation; the machine tender, with only water and wire manipulations at his disposal, is quite limited in what he can subsequently achieve. E.S.

PAPER AND PULP INDUSTRY

AGGARWALA, JAGDISH C. Opportunities in the Far East. India's potentialities. Pulp & Paper 22, no. 10: 44, 46 (September, 1948).

A survey of the present status of the Indian paper industry and its future possibilities is presented. Paper and board production in 1946 amounted to 120,757 tons, the per capita consumption in 1945 being less than one pound (0.78 pound). India has large forest areas spread all over the country, the conifers being mostly at high altitudes in the Himalayas. Since 1910, the industry has been closely associated with the development of bamboos; as a source of raw materials next in importance is Sabai grass. Cotton rags, bagasse, flax, hemp, jute waste, and cereal straws are other sources with which the supply of wood pulp can be supplemented. At present, the government is exploring means by which a newspaper industry can be developed; during 1946, 40,000 tons were consumed, the entire amount being imported from foreign countries. The Forest Research Institute at Dehra Dun is the leading research institute in the East engaged in pulp and paper research. The newly created Moslem state of Pakistan does not contain a single pulp or paper mill; an Indian paper industry would not only have a tremendous home market, but also a possible export market in Pakistan, Burma, Siam, Indo-China, and other nearby countries. E.S.

CHEMICAL ENGINEERING. Inventory of Midwest chemical progress. Chem. Eng. 55, no. 9: 127-41 (September, 1948).

A summary is given of the increases in Midwest chemical process industries. The paper industry of the ten states covered employs 61,000 people, a third of the total for the country. Data giving the number of plants and employees for the various industries are tabulated for each state, with paper and paper products reported together. Expansion and progress are also discussed for the region's largest metropolitan areas. R.R.

MATHIESEN, EINAR. A visit to American kraft paper mills. Norsk Skogindustri 2, no. 7: 184-5, 187-90 (July, 1948). [In Norwegian; English summary]

The author discusses the American kraft paper industry, particularly in the Southern States, its growth and development, and describes machinery, processes, instrumentation, organization, and labor conditions found in the mills which he visited during his trip. E.S.

PORTER, RICHARD W. Pulp and paper in the Midwest. Chem. Eng. 55, no. 9: 148-50 (September, 1948).

Almost a third of the country's paper mills are located in the Midwest. In this region, Wisconsin, Minnesota, and northern Michigan produce most of the wood pulp, Illinois and Indiana the bulk of the strawboard, and Ohio and Michigan utilize a substantial quantity of waste paper. The main trend of expansion is toward further integration, with companies converting increasing quantities of their own paper. A survey is given of the new paper and board machines already installed or projected. The wood supply problem is discussed, as well as the greater use of hardwood pulps, the utilization of sulfite waste liquor, and the problems arising from deinking waste and strawboard waste. Mention is made of the research carried on by The Institute of Paper Chemistry and the U. S. Forest Products Laboratory. The location of the mills is shown on a map of the Midwest, and a list of 200 mills is included. R.R.

RITCHIE, JAMES L., and BETTENDORF, HARRY J. Wood pulp and pulpwood statistics. Fibre Containers 33, no. 8: 131-7 (August, 1948); *cf.* B.I.P.C. 18: 104.

Total production of wood pulp in the United States reached a new record level of 11,951,548 tons in 1947, exceeding the total production in 1946 by 13%. Production during the first five months of 1948 was 7% above the corresponding period of 1947. The average monthly production in the first five months of 1948 exceeded that of 1939 by 82%. Imports in 1947 were close to the record levels of 2,394,605 tons attained in 1937. Whereas Canada and Newfoundland supplied 30% of the total in 1937, and Scandinavia and Finland 63%, the percentages in 1947 were almost the reverse with Canada and Newfoundland supplying 66% and northern Europe 34%. As a result of increased domestic production and imports, the country's total supply was 14,153,100 tons or 14% greater in 1947 than in 1946. Receipts of pulpwood in 1947 totalled 20,624,586 cords, exceeding the receipts of the previous year by 9%. Of this total, 90% were secured from domestic sources and 10% represent imports from Canada. E.S.

TINKER, E. W. A bird's-eye view of the American paper and pulp industry. Barrell's Paper Annual, 1948-1949: 7-10 [1948]

The author considers the pulp and paper industry in regard to employees, assets and sales, profits, forestry, international trade, governmental regulations, and paper consumption. R.R.

TINKER, E. W. The Technical Association and the American Paper and Pulp Association. Paper & Paper Products 90, no. 1: 4-5 (Sept. 20, 1948); Paper Trade J. 127, no. 13: 14 (Sept. 23, 1948); Paper Ind. 30, no. 7: 1086, 1088 (October, 1948).

The author stresses the fact that the industry is financially stable, but that it can be adversely affected by unfavorable publicity. He believes that

the domestic industry will have to supply a considerable amount of the increasing world demand resulting from a rising standard of living. In his judgement, research on the production of wood is greatly needed and in time will produce results which will be of as great importance as the processing developments. R.R.

U. S. DEPARTMENT OF COMMERCE. *Forest Products Branch.* Pulp and paper trade of eight nations. Paper Trade J. 127, no. 9: 20, 22, 24 (Aug. 26, 1948).

Export and import data, as well as consumption figures, are given for the Republic of Panama, Venezuela, El Salvador, Portugal, Iraq, and Rumania. Brief reference is made to news items from Sweden and India. E.S.

VENKAJEE, T. Observations on the future of papermaking in India. Paper Making 67, no. 2: 27-32 (Summer, 1948).

With sufficient pulp resources on hand to supply the world's requirements, India still imports paper to fill her meager needs of one pound per person per year. Experiments conducted in 1910-1912 by William Raitt have shown that Indian bamboo, with a cellulose content of almost 48% before bleaching, is a suitable raw material for paper. Grasses similar to esparto are also available in abundance and can be used for paper. Water supplies are good, with many rivers always in flood and navigable. Although there are coal mines in the central provinces and in the Bengal area, transportation charges to the south and north sections are prohibitive. However, the many rivers and waterfalls make feasible the possibility of using electricity for power. Roads, canals, rivers, and railroads already cover most of the development areas; the extension of existing facilities is the chief requirement. Living standards were considerably raised during the war, which should result in the development of a skilled laboring class. Special consideration is given to the state of Rewa, which is rich in the natural facilities needed for the development of a paper industry. Maps are included to show the existing, proposed, and suggested locations for newsprint, board, and paper mills in the country, the location of available pulp sources in Madras, and the suitable sites for paper mills in Rewa. The varieties of Indian bamboo and species of Indian grasses are listed. R.R.

PAPER AND PULP INDUSTRY—PUBLIC RELATIONS

HALL, A. G. Pulpwood picnic. Am. Forests 54, no. 9: 392-5, 430, 432 (September, 1948).

The Glatfelter Pulpwood Co., Spring Grove, Pa., uses in its mill operations about 35% of "truck wood" from local farmers and landowners. The efforts of Glatfelter foresters are aimed toward keeping the local land highly productive. The company sponsors a year-around program of education and instruction in correct forestry and pulpwood-harvesting methods with an annual "pulpwood picnic" (including sawing, chopping, and peeling contests), of which an illustrated description is given. This annual event helps to make the supplier and his family believe that they are an essential part of the company; it also brings home to the woodland owner the realization of the importance of his trees in the local and national economy. With the exception of the war years, such picnics have been held since 1936, their success being indicated by the ever-growing attendance, rising from about 50 at the first outing to over 700 participating in 1948. E.S.

PAPER AND PULP MILLS

ANON. Down East mill modernizes. Pulp & Paper 22, no. 10: 40 (September, 1948).

The Marcalus Mfg. Co., Lincoln, N.H., is one of the smaller mills which has taken definite steps toward improvements. An illustration is shown of a new wet end with a flow distributor built by Sandy Hill Iron and Brass Works for one of the three Fourdriniers at Lincoln. The company has also a six-grinder groundwood mill and a three-digester sulfite mill at Lincoln, and another groundwood mill at Livermore Falls, Plymouth, N.H. The mill makes daily about 100 tons of sulfite bond and ledger, as well as papeteries and a special meat wrapper. E.S.

ANON. Mexico City's mills. Pulp & Paper 22, no. 10: 48, 51-2, 54, 56 (September, 1948).

In the close-by suburbs of Mexico City five new paper and board mills are now being completed or already in operation. In some cases, it was impossible for the companies to obtain anything but used and rebuilt equipment. In the present article, an illustrated description is given of the Compania Papelera el Fenix, S.A. (making bond, ledger, kraft paper, and wrappings, also possibly tissue in the near future) and of La Cartonera Moderna, S.A. (making boxboard, chipboard, and other light board). E.S.

ANON. The story of development at Coosa Pines. Southern Pulp Paper Manuf. 11, no. 9: 32, 34, 36, 38 (September, 1948); *cf.* B.I.P.C. 18: 246.

The development of the Coosa River Newsprint Co. is outlined, including six illustrations of existing facilities and present construction work. Ground for the new mill was broken on April 17, 1948, and the plant is scheduled to be in operation on January 1, 1950, if not earlier. Long-term newsprint contracts have already been closed for more than 90% of the projected newsprint tonnage; a list of the newspapers which have signed such contracts is appended. E.S.

FULLERTON, F. H. Powell River Co. Ltd. expansion. Paper Trade J. 127, no. 13: 46-8 (Sept. 23, 1948); *cf.* B.I.P.C. 18: 313.

The author reviews some of the new installations in the Powell River plant of the Powell River Co., Ltd., in British Columbia. The company is well up to schedule on its long-range expansion development program. E.S.

HOUGH, MELVIN. Alberta's first mill; pulp and board planned. Pulp & Paper 22, no. 10: 42 (September, 1948).

Reference is made to a projected 175-ton kraft pulp mill at Red Deer, Alta., by the newly formed Alberta Pulp Mills, Ltd. A bleach plant is also planned. Products will be boxboard, bleached board for food and dairy products, and unbleached and bleached pulp, the surplus of the latter to be sold to customers in the United States. The wood supply would include both spruce and poplar. A timber grant for 300,000 acres west of Red Deer is sought from the Alberta government, the execution of the project depending upon this grant. Red Deer River will supply adequate water for power and processing. Capital for the enterprise is reported to come from Canada and the United States. E.S.

PAPER AND PULP MILLS—ELECTRIFICATION

BAKER, R. R. Electrical developments in the pulp and paper industry. Paper Ind. 30, no. 6: 944-8 (September, 1948).

The author presents an interesting resume of the use of electrical energy in the pulp and paper industry and gives statistical figures. In the year 1947, it is estimated that the industry used some 14 million kw.-hr. in produc-

ing approximately 20 million tons of paper. In the year 1945 (last year for which complete figures are available), the industry—among other major industries—ranked first in power/ton of product (700 kw.-hr.), third in installed generating capacity (1,348,000 kw.), and fourth in total kw.-hr. consumed (11,450,000,000 kw.-hr.). The actual power requirements vary for different grades of pulp and paper produced. It is estimated that for chemical pulp production about 7.5-15 h.p./ton are required, and for groundwood pulp, 50-75 h.p./ton. In the manufacture of paper (exclusive of pulp preparation), the requirements for several representative groups are given as follows: paperboard and newsprint, 15-20 h.p.; book and kraft paper, 20-35 h.p.; glassine, 40-50 h.p.; and bonds, 50-60 h.p. It is estimated that 88% of the industry is electrified. The author reviews typical plant requirements, power generators, and power distribution in the pulp and paper industry, as well as special applications, such as general purpose mill motors, synchronous motors and plant power factor, electronic and rotating regulators, the Rototrol (a form of rotating regulator), hydraulic barking, whole-log chippers, supercalenders, and finishing room equipment. Electrical equipment properly selected, installed, and maintained, assures many years of efficient operation. E.S.

PAPER MANUFACTURE

PAPER SALES. Paper making. Part II—Preparing the raw materials. Paper Sales 8, no. 9: 20-1, 30, 32 (September, 1948); *cf.* B.I.P.C. 19: 31.

An illustrated description is given of the preparation of wood and rags for the manufacture of pulp. R.R.

PAPER SIZING

ARLEDTER, HANNS. The relationship between particle size, degree of hydration, and covering power of a colloidal precipitate; a contribution to the theory of sizing. Das Papier 2, no. 9/12: 181-6 (May-June, 1948). [In German]

The author's data (published in detail in his dissertation, Darmstadt, 1944) indicate that the dissociation constant for abietic acid is about 10^{-5} to 10^{-6} (and not 10^{-11} as given in the older literature), and that cellulose—despite its amphoteric character—is unable to cause a significant hydrolysis of sodium resinate (I) to give free rosin (II) and caustic soda. In the beater, (I) is converted in part into calcium resinate by the calcium salts in the pulp and water, and the remainder is transformed by alum into aluminum resinate. This conversion accounts for nearly 100% of the rosin and 64-90% is evidently caused by alum resinate formation. The older theories on rosin sizing hold good only for (II) in the soap which, in commercial practice, usually ranges from 20-35%, and then only for the microscopically visible particles. In a preparation of (I) which is free from (II), no microscopic particles are visible, despite the fact that electrolytes cause the formation of large aggregates of flocculent precipitates. In the formation of (I) containing 30-80% (II), particles of the dimension 0.3-2μ are in evidence and these form larger particles on precipitation. The author suggests the term "primary" for the microscopically visible (and invisible) particles prior to precipitation. The flocculent precipitates contain the so-called secondary and tertiary particles (the latter being the unstable ones that are readily subdivided by mechanical means). The size of the particles in a precipitate depend on the (II) present in the solution used in sizing, the electrolyte used in flocculation, the percentage of electrolyte in the water used in dilution of the size, the type of protective or flocculating colloid present and, also, the

temperature and type of mechanical mixing of the system during precepitation, as well as the length of time which the precipitate is allowed to stand. In an attempt to find a quantitative measure for the varying structure of the precipitate with respect to volume, surface, and water retention, the author has introduced the term "degree of hydration" (H) which gives the amount of water retained by the floc under standardized conditions, obtained from 1 gram resin. For example, when 200 cc. of a size solution containing 2.33 grams rosin were treated in a Lightnin' mixer with 20 cc. 5% alum, the precipitate centrifuged five minutes at 3000 r.p.m. in an Ecco centrifuge, and the mother liquor decanted off sharply, the moist floc, when weighed and the weight divided by 2.33, gave H. The latter varied over wide limits depending on the size used and the precipitating agents employed. By extending the time of centrifuging to half an hour, values for H dropped 15-19%. The temperature was not very critical and the test carried out at 16-25° gave results within the limits of the experimental error. H rises with decreasing (II) content. Thus, a 100% (I) size containing no (II) showed 22.5 H, whereas a size containing 77% (II) showed an H value of 2.65. In a series in which a specific size solution was used and the precipitating electrolytes were varied, alum gave the highest H value (14.6) and sodium chloride the lowest (0.94). The mother liquor from the latter was turbid. When sulfuric acid was used as the flocculating agent at pH 3.4, the pH value of the floc was 2.06 and the liquor showed turbidity. When a mixture of electrolytes was used, H approximated the arithmetic mean of that obtained with each separately. The particle size and H of a sizing agent are correlated with the sizing capacity of a specific sizing material. From a series of mathematical considerations, the author concludes that the sizing effect for a specific weight of resin is a function of the particle size. The smaller this magnitude, the greater will be the size resistance of the sheet, and the more uniform will be the sizing. Rosin precipitates with the smallest possible particle size and the optimum H—provided they form a uniform surface on dehydration—give the best over-all sizing. The size-covering power (for which the author has developed a mathematical formula) gives a numerical expression for the theoretical covering power of rosin particles (diameter 1μ) having a definite density and an (experimentally determined) H. The "precipitations quality number" is H divided by the particle size and gives numerical information on the functional relation between sizing effect, H, and particle size. 12 references. L.E.W.

PAPER SPECIALTIES

ANON. Packers' frozen meats. Modern Packaging 22, no. 1: 108-12, 202, 204 (September, 1948).

Big meat packers are generally taking the position that the cutting and packaging of fresh meat at the packing plant is impractical. Several smaller packers are packaging and branding smoked and processed meats, but the best opportunity seems to be in frozen meats. Frozen packaged meats mean reduced shipping costs; 40,000 to 50,000 pounds of usable meat might be shipped in a refrigerator car which would hold 23,000 to 25,000 pounds shipped as carcasses or wholesale cuts. The elimination of natural shrinkage would result in a saving of 0.5 to 1% of the total weight. Refrigeration for frozen meat would increase refrigeration costs only about a third or a fourth, an increase which would be readily justified by the additional volume that could be shipped. A discussion is given of the problems to be met in this field, including the determination of the most acceptable packaging materials and methods, overcoming consumer sales resistance and unfamiliarity with the storage and cooking of frozen meat, and personnel problems inherent in a new merchandising arrangement. A resume is given of developments in the packaging of frozen meat as they are being tested by some of the larger packing houses. R.R.

ANON. Pliofilm bag with paperboard collar, Western Packaging Show innovation. Packaging Parade 16, no. 188: 45 (September, 1948).

An unusual innovation in the packaging field is the Dent-O-Pak, a Pliofilm bag with a paperboard collar, adhesively adhered, which serves as an opener, loader, closure, handle, and means of identity. Closure is by heat sealing or stapling. The collar also assures that the closing head will be straight when the package is on display, eliminates wrinkles in the bag, and distributes the weight of the contents over the whole bag top. The bag is designed for use on the Dent-O-Matic loading machine, which facilitates the insertion of carrots, corn, etc. The machine is illustrated and its operation described. One inexperienced operator can work at a speed of 18 bags per minute. R.R.

LATIMER, ROBERT. Tags for batteries. Am. Paper Merchant 45, no. 9: 28 (September, 1948).

A battery tag is now being used which resists acid action and incorporates file records and a claim check into the same form. The card is divided into three parts: the upper, containing a number for identification, is heavily coated with carnauba wax, which is sufficiently resistant to battery acid; the center is a file card which serves as a permanent record of the sale or service, as well as a prospect file; and the third is the customer's claim check, which is provided with a key-shaped hole so that it may be slipped over some protruding part of the dashboard and serve as a reminder to the customer to pick up his own battery and return the loaned one. R.R.

MICKELSON, OTIS. How to sell quality napkins. Paper Sales 8, no. 9: 15-16 (September, 1948).

A paper salesman gives suggestions for selling the high quality facial tissue napkins, using their softness, "lap-drape" quality, economy, and competition from other users as selling points. R.R.

THE TODD COMPANY, *Rochester, N.Y.* Fraud-preventing checks use 10,000,000 pounds paper yearly. Paper Mill News 71, no. 39: 42 (Sept. 25, 1948).

The Todd Co. uses 10,000,000 pounds of paper yearly for the production of 2,000,000,000 safety checks for banks. The use of an ink eradicator on the face of these checks develops hidden printing, "VOID," which permanently cancels the check. Attempts at mechanical erasure result in a white mark which cannot be successfully retinted. As a third safeguard, the checks are insured against fraudulent alteration. From the time the stock leaves the mill, it is guarded to prevent its falling into the hands of counterfeiters. A description is given of the special processes of manufacturing Protod-Greenbac checks, including watermarking, the printing of "VOID" in invisible indelible ink over the entire surface of the paper, and the printing of an all-over camouflaging pattern in a secret design. R.R.

YUMA FROZEN FOOD COMPANY, *Yuma, Ariz.* Wrap-cartoned steaks. Modern Packaging 22, no. 1: 113-15 (September, 1948).

Tenderettes (frozen tenderized cube steaks) are now being sold in a package made of a scored paper strip bonded to a flexible printed sheet, the whole forming a single flat sheet which folds into a carton-type wrap. The original package of supercalendered sulfite held together with gummed kraft tape was discarded because of lack of consumer appeal. The new package is made of 50-pound bleached sulfite and 23-pound plasticized opaque glassine bonded together with a blend of waxes which will not be affected by low temperatures. R.R.

PAPER SPECIFICATIONS

KANTROWITZ, M. S. How Uncle Sam buys paper. Barrell's Paper Annual, 1948-1949: 17-20 [1948]

The Government Printing Office annually purchases, on technical specifications, approximately 100,000,000 pounds of paper, varying from newsprint to the highest grade bond. The specifications include microscopical, physical, and chemical tests for minimum quality. The requirements and various tests are briefly considered. R.R.

PEANUT

ARTHUR, JETT C., JR., MASON, T. W., JR., and ADAMS, MABELLE E. Peanut protein paper coatings. J. Am. Oil Chem. Soc. 25, no. 9: 338-40 (September, 1948).

Proteins from solvent-extracted peanut meals have a fairly high solubility and can, therefore, be dispersed at low pH values, having potential applications in paper coating formulations. Proteins from hydraulic-pressed and screw-pressed peanut meals are not suitable, since they are less soluble and require a solution of a higher pH to disperse the protein; the dispersions prepared in this manner weaken the raw paper stock. Solvent-extracted peanut meal and peanut protein may soon be available in commercial quantities. The costs of isolating and processing peanut protein compare favorably with those for producing other industrial proteins. In view of this potential availability, an investigation was made of the conditions under which peanut protein could be used as an adhesive in paper-coating formulations. The adhesive properties were found to be dependent on several critical factors, such as the type of protein, pigment, and dispersing agent; pH; protein-pigment ratio; and total solids content of the slips. The adhesive strength was tested with the standard Dennison waxes. When neutralized protein is used as the adhesive, coating slips containing 40% solids can be prepared with pH values as low as 6.3; when these slips are applied to raw stock, the coating has wax pick values satisfactory for many printing operations. Over a pH range of 8-12, coatings prepared from unwashed protein give high wax pick values, whereas those prepared with water-washed protein give slightly lower values. 5 tables and 11 references. E.S.

PECTIN

MACLAY, W. DAYTON, and OWENS, HARRY S. Pectinate films. Modern Packaging 22, no. 1: 157-8 (September, 1948).

Research is being done at the Western Regional Research Laboratory on the use of low-methoxyl pectin in the preparation of films, among them those used as packaging agents. They are edible, and may be applied by dip coating and drying to form uniform, protective, and attractive films. Extruded films have insufficient tear resistance to compete with regenerated cellulose. The film resulting from dip or spray coating is nonadhesive and might be used on glacéd fruit, soft dates, etc. The edibility and tenderness of the film suggests its use on meat preparations. Some have been found unsuccessful; others are still to be tried. Pectinate films may find use as antisticks and as carriers of fungicides, antioxidants, vitamins, and other agents, some of which may be used to protect seeds before germination. Another application is as a gel coating to replace ice glazing on frozen foods. R.R.

PHYSICAL TESTING—PAPER—GLOSS

HUNTER, RICHARD S. Gloss recorder with automatic standardization. Paper Trade J. 127, no. 12: 51-3 [T.S. 393-5] (Sept. 16, 1948).

A 75° gloss exposure head has been devised for gloss measurements. In the laboratory, this head may be used with a slide-wire measuring device. This same exposure head may be used in the mill to give continuous records of gloss. It is operated in conjunction with a specially modified recorder of the type widely used in many process measurement and control problems. To obtain continuous measurement of gloss, a method of keeping this apparatus in calibration had to be devised; it consists of automatic standardization using a fixed beam of light as standard. 4 figures. E.S.

PHYSICAL TESTING—PAPER—STIFFNESS

HOFFMANN JACOBSEN, P. M. Measurement of the stiffness of paper. Das Papier 2, no. 9/12: 170-7 (May-June, 1948). [In German] *cf.* B.I.P.C. 17: 512.

The author gives a detailed description of the simple laboratory equipment used in measuring the stiffness of paper and board, together with an illustration and diagram of the apparatus, details regarding its operation, and the mathematical theory underlying his calculations. Tabulated data are given for a series of commercial board and paper samples. The article covers the identical material discussed in the previous reference, although the present description is more extensive. L.E.W.

PHYSICAL TESTING—PAPER—WET STRENGTH

NOLL, AUGUST. The Hydroscope, a new apparatus for testing paper. Wochbl. Papierfabr. 76, no. 6: 140-1 (June, 1948). [In German]

The apparatus consists of a glass cylinder with a centrally perforated metal cover through which passes a metal rod at the end of which is a clamp which holds the upper end of the paper test strip. To the lower end of the paper sample there is attached, by means of a suitable clamp, a 250-gram weight (or a 100-gram weight in the case of weak papers). The metal fittings are of brass. The test is made at 20° C., either in air at 100% R.H. above a water column or by rapid and complete immersion of the test strip in water. The time (accurately clocked) between the lowering of the strip into the water and the final rupture of the sample is a measure of its strength. Elongation prior to rupture may also be measured in the apparatus. In addition to water, salt solution could be successfully used. The equipment—detailed sketches of which are given—is made by Fritz Kühn, Frankfurt/Main, Germany. L.E.W.

PHYSICAL TESTING—PULP—BEATER PROCESSING

IMSET, OTTO. The beating of pulp for paper manufacture. Svensk Papperstidn. 51, no. 16: 362-9 (Aug. 31, 1948). [In Norwegian; German and English summaries] *cf.* abstract below.

The development of the beating technique is discussed from two different angles, the general (I) and the specific (II) beating technique. (I) comprises the construction of the beating apparatus and its operation for the purpose of obtaining the maximum physical strength of the paper manufactured from the beaten pulp. As a typical example of (I), the laboratory beating devices and their beating results are listed. However, in applying (II), the adjustment of the beating apparatus and the operation of the beater for obtaining the maximum strength properties are not sufficient;

special paper-technical requirements are also taken into consideration, as well as local conditions and the operations following the beating procedure, such as the drainage on the Fourdrinier wire. With these objects in mind, new methods for evaluating the beating results obtained in the laboratory and mill have been developed and are analyzed. They form the basis for the construction of the P.F.I. mill, which is described briefly (three illustrations). The similarities between mill and laboratory beating of pulps are employed as a basis for these general methods which make the quantitative and qualitative comparison between mill and beating laboratory experiments possible. The relationship between the various important factors is discussed rather in detail and illustrated in 13 diagrams. E.S.

STEPHANSEN, ERIK. Beating of cellulose. Norsk Skogindustri 2, no. 8: 207-22 (August, 1948). [In English; Norwegian summary]

The deficiencies of the existing types of laboratory beating equipment for evaluating the quality of pulp are pointed out; attention is drawn to some conditions which must be fulfilled by a suitable beating device. The most important requirements placed on an apparatus of this type are: reproducibility of results over long periods of time and ability to treat the fibers in such a manner that cutting is avoided. The author is not of the opinion that the first and most necessary requirement to be fulfilled by a laboratory beater is that of being able to duplicate exactly the beating procedures of the mill beaters, hardly two of which in the same mill beat in the identical way. The cutting of the fibers with sharp knife-like edges must always be considered a mistreatment of the fibers and the results should never serve as a basis for evaluating the properties of fibers as grown in nature or as changed by digesting and bleaching. The correct information of the true potential character of the fibers can be obtained only when the treatment is confined to a mere rubbing or pressing action. One of the most difficult problems connected with this type of beating is the renewal of the pulp layer between the beating surfaces. The three most generally employed beating devices (Lampén mill, Jokro mill, and Valley beater), their shortcomings, and experimental modifications by the author are reviewed. The results formed the basis for the development of the P.F.I. (Papirindustriens Forskninsinstitutt) mill, of which a detailed description is given, supplemented by one illustration and several diagrams. The circular housing (bedplate) and beater roll form two separate units, each driven horizontally by its own motor; each unit can, therefore, rotate (in the same direction) quite independently of the other, making it possible to obtain whatever relative peripheral speed is desired. The housing and its motor can be raised or lowered by means of a worm screw; it has an opening on top just sufficiently large to permit the insertion of the roll, the opening being then covered with a lid. The pressure between roll and bedplate and the distance between the beating surfaces can be adjusted by a lever and weight arrangement, and a screw, respectively. The beater roll of the first Norwegian laboratory model has a diameter of 20 cm. and is provided with 33 knives (bars) equally distributed over the entire periphery; it is inserted and held in place off the center of the housing, so that only a limited, but constant number of the bars is continuously in contact with the bedplate, independent of the relative peripheral speed. This arrangement makes the beating capacity of the mill very large. The roll may be given very large angular velocities, in spite of which the relative velocity between the beating surfaces may be kept relatively low. The roll revolves at 1500 r.p.m., causing the pulp between the beating surfaces to be treated by nearly 1000 bars per second. The mill is designed to treat 25 grams of pulp per charge, the same amount as that used in the Lampén mill. A sample of that size can be beaten to 80-90° S.-R. in a few minutes. It is

also possible to beat at any desired consistency. Bronze was used as the construction material for the first mill and proved satisfactory; it will probably be employed in future models. Although the mill has been in use a relatively short time only, it can be stated that it gives very reproducible results; it should not be difficult to build future models exactly alike. However, before it will be possible to arrive at definite conclusions concerning its value, additional units must be constructed and operated by many different investigators over a longer period of time. Some experiments with sulfate and sulfite pulps carried out with this mill and the results obtained are discussed. When pulp is beaten, two essentially different processes are apparently taking place at the same time: one is the direct pressing and rubbing between the metal beating surfaces (I), and the other is the beating effect arising as a consequence of the internal friction between the individual fibers (II). In the case of sulfate pulp, the beating was carried out at a comparatively high pressure of 3.4 kg./cm. line contact of roll and housing, representing (I) and also at a fixed distance of 0.5 mm. between the two surfaces, representing (II). In both cases, consistencies from 3-20% and a relative peripheral speed of 5.5 m./sec. (the same as for the Valley beater) were used. The beating was carried out in an acid medium (pH about 4.6), without addition of chemicals (pH about 7), and in an alkaline medium (pH about 8.5). When beating by (II), it was found impractical to lower the consistency beyond 5% on account of the tremendous increase in beating time with dilution, resulting in a temperature rise of such an extent that the water gradually evaporated. By alternately heating and cooling the housing and the roll during the beating experiments, it was sought to ascertain any possible temperature effect on the resulting pulp properties and sheet formation, but without success. Barring extreme conditions, the normal beating periods are so short and the temperature increases so small that they have hardly any influence on the results. Under the experimental conditions employed, the highest possible breaking length was obtained in an alkaline medium at low consistency and with a comparatively large beating pressure. Maximum tear and stretch resulted from beating in an acid medium, at a high consistency, and with low pressure. In order to obtain the most favorable combination of strength figures, it is necessary to beat in an acid medium at a high consistency and with a sufficiently high and correct beating pressure. In the case of sulfite pulp, it was found that beating at a sufficiently high pressure resulted in higher breaking length and lower power consumption. The beating degree at the same breaking length is lower and the drainage times are simultaneously shorter, the higher the pressure. Fiber fractionation of the beaten pulps showed that the beating degree is almost exclusively determined by a small amount of fines with very low strength properties, and that the coarsest fraction gives the highest strength (higher than the nonfractionated pulp) at the same beating degrees and drainage times as for the unbeaten pulp. The relationship of the various properties is also illustrated in a number of curves. The experiments indicate the possibilities for developing the strength properties of a pulp without simultaneously making the beating degree too high and the drainage time too slow. E.S.

PHYSICAL TESTING—RATE OF SOLUTION

NOLL, AUGUST. Apparatus for determining the rate of solution. Wochbl. Papierfabr. 76, no. 6: 138-40 (June, 1948). [In German]

In its outer form, this simple apparatus resembles that devised by the author for determining swelling indices of pulp (*cf.* B.I.P.C. 1, no. 8: 18 [April, 1931]). A calibrated glass cylinder holding over 100 cc. is loosely capped with a metal cover provided with a central perforation through which passes a stainless steel or nickel rod connected at right angles at its lower end with a suitably perforated metal base plate. When not in use,

this stirring device is held in place by a set-screw. Mixing is effected by loosening the screw and by manually gently raising and lowering the stirrer. The tests are carried out at 20° C. To 100 cc. of the solvent in the cylinder, 1 gram of the solute is added and the stirrer is set in motion. The time in seconds elapsing between the addition of solute and its complete disappearance is carefully clocked and furnishes a measure of the rate of solution. Tests made in quintuplicate checked quite well. Results are given for various commercial samples of sodium sulfate and sugar in water, naphthalene in solvent naphtha, and crude anthracene in pyridine. The apparatus may also be used in the dairy industry, serving as a miniature butter churn and giving the rate of fat coagulation in cream. L.E.W.

PLASTIC FILMS (NONCELLULOSIC)

MORGAN, P. W. Permeability of laminations. Modern Packaging 22, no. 1: 159-60 (September, 1948).

The author reports on the novel effect on moisture permeability obtained when a film of hydrophilic polymer, such as polyvinyl alcohol (I), is laminated with a layer of moderately moisture-permeable polymer. When (I) is placed on the low humidity side of a barrier, it shows an apparent permeability considerably lower than the film adjacent to the moisture source; placed on the high humidity side, (I) is no barrier to moisture vapor and diffusion is limited only by the less permeable layer. When (I) is laminated with materials such as polyethylene, vinyl chloride-diethyl fumarate, butyl rubber, or polychloroprene, it appears to have a lower permeability than the more hydrophobic material. Moisture permeation through film edges and pinholes is believed to be of slight importance. Laminations of this type are important for obtaining permeability data on materials which are too tacky, limp, fragile, etc. for use as self-supporting films. As wrappings these laminates are of value in vacuum packaging or for packages in which a low humidity is maintained by a desiccant. A method is given for the preparation of the films and laminates and for the measurement of moisture permeability according to Charch and Scroggie (*cf.* B.I.P.C. 6: 184-5). Data are tabulated on the moisture permeability of polymers coated on (I). R.R.

POLYMERIZATION

WINDING, CHARLES C. Polymerization. Ind. Eng. Chem. 40, no. 9: 1643-9 (September, 1948).

This review on the unit processes of polymerization covers concepts, methods, equipment, and important developments which have occurred since the start of the war. 151 references. E.S.

PRINTING AND PRINTER'S INK

THE AMERICAN PRESSMAN. Printing paper lessons. TAPPI Bull. no. 90: 2 p. (Sept. 20, 1948).

In an article originally published in *The American Pressman,* a printer comments on his past experiences with paper, and gives practical suggestions regarding the type of paper, quality, cost, and source. R.R.

GOAT, ARTHUR F. Advantages of modern rotogravure. Shears 66, no. 669: 67-9 (September, 1948); *cf.* B.I.P.C. 18: 842.

In both commercial and publishing gravure, the Weiss Speedry totally enclosed ink fountain is the most important single development of recent years, and is largely responsible for their growth. It removes the splash problem, allows the use of highly volatile inks, inhibits the drying-in of the ink on

the printing cylinder surface prior to impression, and eliminates the need for extensive wash-up. Sheet-fed gravure permits fine gradation, gives good tonal effects, and great artistic quality. Commercial rotogravure gives quality reproduction and speed. Press operation is very simple, with push buttons on modern machines controlling impression register, dryers, operational speeds, and color register. Almost any material can be printed by gravure and many, such as cellophane, vinyl films, foil, and glassine, can be printed well by this method alone. Installations for roll labels, waxed wraps, cardboard, and decalcomanias indicate a great future for rotogravure. An over-all or spot coverage of lacquer applied in line with the printing by a standard color unit can eliminate a separate varnishing operation. The capital investment, labor, and space requirements are comparatively low. R.R.

HOGAN, RUSSEL J. Ink problem. TAPPI Bull. no. 88: 2 p.; no. 89: 2 p. (July 30, Aug. 18, 1948); *cf.* B.I.P.C. 17: 83-4.

This is the identical article, published for two consecutive years in the *American Printer,* the first time under the title "Blueprint for correcting ink problems" in the September, 1946, issue; it was reprinted under the title "Ink difficulties and how to cure them" in the December, 1946, and December, 1947, issues. E.S.

PYRITES

WURZ, OTTO, and WURZ, ERICH. Roasting copper pyrites for the production of sulfite cooking liquor. Das Papier 2, no. 9/12: 190-1 (May-June, 1948). [In German]

Roasting of copper pyrites (chalcopyrite) (I) should be so conducted that the formation of sulfur trioxide is avoided to the greatest possible extent. In a seven-compartment furnace with two rabble arms for each compartment and handling charges of 3600-4000 kg. dry (I) per diem, the temperature in the third compartment was maintained at about 700° C., provided (I) contained about 34% sulfur, 32% iron, 28% copper, and smaller amounts of lead, nickel, zinc, arsenic, cobalt, calcium oxide, and antimony. When (I) contained about 47% sulfur, this temperature was raised to 850°. The resulting gases were passed at 240° via a short tube through the electrical fields of two Lurgi precipitating chambers and subjected to a pulsating direct current (48,000 volts), thus precipitating in fine dustlike form 2.7-3% of the weight of (I) and yielding largely iron, arsenic, and sulfate, together with traces of copper and calcium. After passing through a Lurgi cooling system, the gas contained 5.5-6% sulfur dioxide and 0.25-0.3% sulfur trioxide. The calcination residue [81% by weight of the original (I)] still retained 3.5-3.8% sulfur and 28-30% copper (a portion of which was in the form of copper sulfate). Storage of this residue should be under shelter so as to obviate leaching losses caused by rainfall. Tower acids using sulfur dioxide derived from (I) behaved normally. The technological implications of roasting (I) are discussed briefly. L.E.W.

RAYON—VISCOSE PROCESS

SAMUELSON, OLOF. Influence of the properties of cellulose on the filtration of viscose. Svensk Papperstidn. 51, no. 15: 331-5 (Aug. 15, 1948). [In English; German and Swedish summaries]

From a large number of filtration tests on viscose made on a laboratory scale from two commercial spruce sulfite pulps, it has been possible to establish a relationship between the filterability (I) of the viscose and the analytical data of the pulps. The studies indicate that the clogging of the filters increases as the content of silica increases and that of resin decreases. The

second observation was confirmed by laboratory experiments when the pulps were extracted with alcohol. When recirculated steeping liquor is employed for the steeping of pulp with low resin content, a better filtration results than when pure sodium hydroxide is used for this purpose, provided the recirculated liquor is low in hemicelluloses. This improvement results from the lower surface tension of such liquor. (I) of pulps with a low resin percentage can be improved by the addition of wetting agents during the steeping or shredding of the pulp; when added during the dissolution of the xanthate or to the viscose, wetting agents did not exert any marked influence on (I). 15 references. E.S.

RESEARCH

MCFARLANE, W. D. Chemurgy in Canada. Chemurgic Digest 7, no. 9: 22-6 (September, 1948).

The author gives a brief summary of the objectives of the National Chemurgic Committee of Canada, which was organized in 1938 and is now being reorganized. Some of the recent developments in Canadian chemurgic research are reviewed and mention is made of the technological and economic background of the problems involved. Among the products studied are linseed, soybean, sunflower, and rapeseed oils, starch and gluten recovered through the fractionation of wheat, fermentation products of wheat in particular, crop residues, fiber flax, and fruit juices. Of particular interest to the pulp and paper industry are the investigations conducted by the National Research Council of Canada on the papermaking qualities of various straws. A laboratory procedure has been developed which removes the lignin, but leaves the holocellulose, which would essentially double the yield of usable pulp from straw. The resulting papers are of a glassine or parchment type, with a comparatively low density and tear resistance. The most attractive possibility for using straw seems to be in its conversion into insulating board. R.R.

RIDDELL, G. L. Research for the newspaper printer. PATRA J. 11, no. 1: 4-9 (January, 1948). [Confidential to members of PATRA]

The author briefly considers the points in PATRA's research program which are of special interest to the newspaper printer, including printing, inks, paper, process engraving, and stereotyping. Studies of paper include work on static electricity in paper and those physical properties which control printing quality: optical and absorptive properties, surface contour, and wettability, with emphasis thus far on the first two. R.R.

RESEARCH LABORATORIES

ANON. Great American research laboratories. I. The Hercules Powder Company. Barrell's Paper Annual, 1948-1949: 11-16 [1948]

A history is given of the research laboratories of the Hercules Powder Company, their organization, and activities. Special consideration is given to the Paper Makers Chemical Department and some of the developments from naval stores and cellulose raw materials, such as Dresinate 731, a disproportionated rosin soap used in the manufacture of synthetic rubber; Staybelite, a hydrogenated rosin of value in the field of pressure-sensitive adhesives; Toxaphene, an insecticide; sodium carboxymethylcellulose (CMC), a water-soluble gum; and ethylcellulose. R.R.

RESIN, SYNTHETIC—IDENTIFICATION

WIDMER, G. Detection of melamine and urea resins in wet-strength paper. Textil-Rundschau 3, no. 7: 236-41 (July, 1948). [In German]

The physical properties of the paper are examined as an indication of wet-strength agents and of rosin. The presence of formaldehyde is determined by distilling the paper with 2 *N* sulfuric acid into a concentrated sulfuric acid solution of carbazole. Nitrogen is detected by the sodium fusion test. If the paper contains both nitrogen and formaldehyde, melamine or urea resins are probably present. To test for melamine, the paper is boiled with 80% acetic acid, filtered, and the filtrate evaporated to dryness. The residue is heated with aluminum granules in an ignition tube and, if melamine is present, a ring of sublimate forms. A portion of the water solution of the sublimate is evaporated on a slide, yielding characteristic crystals of melamine. Another portion is treated with 1% picric acid solution, which yields with melamine a precipitate of melamine picrate having distinctive crystal forms. The xanthydrol test for urea has been modified to prevent interference of rosin. The paper is refluxed with 10% acetic acid, filtered, and the filtrate treated with 0.25 cc. of a 1% solution of xanthydrol in methanol. The solution is evaporated to dryness on the steam bath, the residue transferred to a small test tube, dissolved in 0.25 cc. of pyridine, and cooled slowly. In the presence of urea, a white crystalline precipitate is formed, which shows crystals of characteristic forms upon microscopic examination. The tests are described in detail and the various crystal forms are shown in six photomicrographs. B.L.B.

ROSIN

SKEEN, JOHN R. Rosin in soap. Soap Sanit. Chemicals 24, no. 9: 46-7, 149 (September, 1948).

The author summarizes the use of rosin in soap, beginning with 1934, and discusses the production of rosin in this country from its beginning. At the present time, about 11% of the rosin produced is used in the soap industry, 30% by the paint and varnish industry, and 25% by the paper industry. Data are given on the domestic supply, consumption in soap, and price from 1934-35 to 1947-48. R.R.

SAFETY

KROLL, HOWARD. A safety program founded on accident prevention . . . not first aid. Paper Ind. 30, no. 6: 881-2, 888 (September, 1948).

The methods are described which are employed by the Blandin Paper Co. for the prevention of accidents. The first step was the formation of a safety committee of ten foremen, with each department represented. Each foreman was to assume individually direct responsibility for safety in his department and, with the others, responsibility for safety in the entire plant. Credit is also given to the co-operation of the insurance carrier, the activities of the safety school program of the Duluth Chamber of Commerce, and management interest. Reference is made to the use of meetings, bulletin boards, safety buttons to men who have gone a number of years without accidents, etc. E.S.

SHIPPING CONTAINERS

ANON. An innovation in packaging of photographic equipment. Packaging Parade 16, no. 188: 42 (September, 1948).

A double container is being used to package a tripod projection screen. The outer container is a conventional corrugated box for protection in shipping;

the inner container is for dealer display, carrying home, and storage. A tuck-in flap on the inner package permits reuse. The handle of the screen projects through the inner carton for ease in carrying. R.R.

CHEMICAL INDUSTRIES. Packaging and shipping: the industrial frontier. Chem. Industries 63, no. 3: 396-9 (September, 1948).

A survey is given of packaging and shipping at the present time. Sections of interest to the paper industry are as follows: Callahan, T. Pat. Miscellaneous packages, p. 397-8; and Lortz, Richard. Handling trends, p. 399. R.R.

HOFFMAN, ALFRED W. Current developments in packaging and containers. Paper Mill News 71, no. 39: 28, 30 (Sept. 25, 1948).

The outstanding trend is one of intensification and promotion of practices and processes which are not new in themselves, but were held back by the war and immediate postwar economy. The expansion of facilities for pulp and paper production is spectacular. The supply of boxes is rapidly catching up with demand, with the results that competition is returning, quality is improving, the use of jute linerboard is decreasing, and there is greater commercial exploitation of such developments as weatherproof solid and corrugated fiberboard containers. A description is given of the Vus boxes, and the increased supply and diversification of use of wet-strength papers are mentioned. Three developments in the corrugating field are becoming increasingly important: the expanded use of semichemical pulps and the utilization of hardwoods, the growing popularity of C-flute corrugating rolls, and laminated corrugations, which are an attempt to improve the strength properties of the container as economically as possible. R.R.

SHIPPING CONTAINERS—FROZEN FOODS

DENNY, J. L. Quick-frozen foods create a new field for packaging and printing, with problems which PATRA is studying. PATRA J. 11, no. 3: 51-8 (July, 1948). [Confidential to members of PATRA]

The author outlines the processes used in quick-freezing foods and discusses the functions of quick-frozen food packs. In addition to the usual purposes of a package, they should be moisture-vapor and air impermeable, liquidproof, and allow for rapid freezing. The use of bags, waxed cartons, waxed tubs, composite containers, and metal foil is considered, and the printing of such packages is mentioned briefly. R.R.

SHIPPING CONTAINERS—STATISTICS

BETTENDORF, HARRY J. Fibre box industry statistics. Fibre Containers 33, no. 8: 148-57 (August, 1948); *cf.* B.I.P.C. 18: 120.

The fiber box industry established a new record high production in 1947 with over 62 billion sq. ft., of which corrugated accounted for nearly 60 billion and solid fiber for the residual almost two and a half billion. Detailed statistical information on both types of board is given in numerous tables, diagrams, and pie charts, chiefly covering the period from 1937 to 1947 inclusive. E.S.

HANWAY, PAUL S., and BETTENDORF, HARRY J. Fibre can and tube industry statistics. Fibre Containers 33, no. 8: 182-3 (August, 1948); *cf.* B.I.P.C. 18: 120-1.

Much of the war-gained volume of fiber cans and tubes—owing to the shortage of tin and glass containers which prevailed—was lost in 1946 and 1947, because board shortages made it difficult to consolidate the wartime gains. The estimated value of can and tube shipments in 1947 was about 8% greater than in 1946, the tonnage of board consumed being probably very similar to that used in 1946. There have been great strides in the development of new adhesives, coatings, lacquers, impregnations, films, and laminations in connection with boards and the winding of tubes, which will no doubt result in new applications in many other fields. Brief reference is made to some of the activities of the National Fibre Can & Tube Association; in conclusion, a description of the products included under the terms fiber cans and tubes is given, as well as their methods of manufacture and the types of fiber or metal ends used. E.S.

MATHER, GLENN, and BETTENDORF, HARRY J. Fibre drum and pail industry statistics. Fibre Containers 33, no. 8: 184, 186-8 (August, 1948); *cf.* B.I.P.C. 18: 121.

After an industry poll last year, the general consensus was almost unanimous in favor of using the term "drum" for all containers, large or small, to indicate a straight-sided cylindrical container. The world "barrel" should be used to indicate a container with curved sides or a bilge. Although fiber drums with staves or curved sides were tried unsuccessfully a few years ago, there are—strictly speaking—no fiber barrels available at present. Fiber drums rank high in essentiality in the national economy; they enjoy an excellent reputation as shipping containers for either domestic or export shipments for a long list of products, chiefly for dry bulk powders, to which several additions have been made during the last year. Capacities range from 173 cu. in. up to 10 cu. ft., with diameters usually from 8-23 inches and depths from 3½-42 inches and more. The maximum weight of contents which may be shipped in fiber drums under current freight regulations is 400 pounds. There are five optional types of tops and bottoms for a 400-pound drum as follows: two fiber types of various thicknesses, steel, solid wood, and plywood. The methods of integrating the tops and bottoms vary; many types of closures are used (locking bands, expanding or crimped lids, nails, metal lugs or clips, friction-type or telescopic slip-on covers secured by sealing tape, etc.). Of equal importance are the smaller drums, ranging roughly from about 175 pounds down to less than one pound. For commodities of a hygroscopic or deliquescent nature, a barrier material is incorporated in the construction of the drum, which represents an additional cost factor and is not necessary for many commodities. However, the exteriors of all fiber drums are made water resistant to the extent that the contents will not be damaged during loading or transit if subjected to ordinary weather hazards. Typical usages of fiber drums are listed. A few statistics are shown for the period 1940-1947. The number of units produced in 1947 shows an increase of 2% over the 1946 production. E.S.

SHIPPING CONTAINERS—TESTING

ANON. Moisture determination method vs. weight gain or loss method in packaging research work. Packaging Parade 16, no. 188: 40-1 (September, 1948).

A comparison is made of the advantages and disadvantages of the package weight gain or loss method and the product moisture determination method of ascertaining the water-vapor protection of a package; a description of each method is given. The former produces results which cannot be given as a constant because of the progressively diminishing gain or loss in moisture with time under constant storage conditions. It is also affected by the nature of the packaging structure and the location of the water-vapor barrier—i.e., whether it is on the inner or outer surface of the package. However, it is

convenient and necessitates only a reasonable expenditure of time and effort. The latter method is time consuming and requires considerably more work. It needs a large number of packages and, therefore, rather extensive storage facilities. It is impossible to run a moisture analysis on the same packages throughout the storage period, because they must be opened for the determination; this introduces inevitable errors in the procedure through possible imperfections in the materials or seals. On the other hand, this method gives the actual moisture gain or loss of the product in each type of package, the results of which can be interpreted in terms of product shelf life and can be correlated with field storage studies. 4 diagrams. R.R.

MALCOLMSON, J. D. The testing and designing of fibreboard containers. Paper Ind. 30, no. 6: 942-4 (September, 1948); Paper Mill News 71, no. 39: 29-30 (Sept. 25, 1948); Am. Boxmaker 37, no. 10: 19, 22-4 (October, 1948); Shears 66, no. 670: 49 (October, 1948); Southern Pulp Paper Manuf. 11, no. 10: 40-2 (October, 1948); Paper Trade J. 127, no. 14: 34-5 (Sept. 30, 1948).

The author reviews briefly the development of fiber box testing equipment and the purpose of the various tests (drum, compression, drop, impact, vibration tests, etc.), with emphasis on the importance of constant humidity and temperature conditions. Committees representing various commodity interests are now at work in an endeavor to develop specifications and performance tests for specific articles, because it has been recognized that there is no universal specification that will cover fiberboard containers for all commodities. In Rule 41, glassware and liquids in metal are the only items whose container specifications are covered. The design of the container must be adapted to the nature of the contents. With liquids in glass, it is of utmost importance to protect the bottles from each other and to produce a snug fit. For packing expensive fragile objects (small radios, television sets, etc.), the designer has to think in terms of protection from outside blows and impacts and to provide creased sheet "air cushions" around all sides and keep the contents from shifting. Both designs may be checked by drum and drop tests or, if the case is large and heavy, by additional impact tests. An electric fan is a good example of a commodity combining heavy weight at one end and fragile portions on the other. If the heavy base and motor are securely locked in such a way that they will not shift inside the box, the blades need no particular attention. Heavy objects, like washing machines or electric refrigerators, usually require a wooden skid, to which the contents and the fiberboard box and packing are securely anchored, usually with steel straps. One of the largest producers is now shipping all his domestic refrigerators in a corrugated package with wooden skid (Rule 49 permit); he is saving money in freight and has hardly any claims on this package. E.S.

RIDDELL, G. L. Research into quick-frozen food packaging. PATRA J. 11, no. 3: 59-63 (July, 1948). [Confidential to members of PATRA]

The author briefly considers the work being done by PATRA on problems applicable to packaging for quick-frozen foods: water-vapor permeability, air and oxygen permeability, liquid penetration, the strength of frozen food packs, and heat transfer. Illustrations are given of a refrigerated thermostat used for work down to —10° F. and of apparatus for studying gas and water-vapor permeability. R.R.

STARCH

BERNFELD, P., and FULD, MARIA. Amylolytic enzymes. IV. Determination of the activity of α-amylase. Helv. Chim. Acta 31, no. 5: 1420-3 (Aug. 2, 1948). [In French]

A new rapid method for the determination of α-amylase activity is described. The method is based upon the comparison of the iodine coloration of the enzymatically degraded starch with a set of color standards which are prepared by mixing various dyes. The method is accurate to ±5%. J.W.S.

BERNFELD, P., and FULD, MARIA. Amylolytic enzymes. V. Comparison of the enzymatic action of α-amylases from various sources. Helv. Chim. Acta 31, no. 5: 1423-7 (Aug. 2, 1948). [In French]

The ratio of saccharogenic power to dextrinogenic power as measured, respectively, by reducing power and change of iodine coloration was used to show any differences in the action of various α-amylases on soluble starch. It was found that the crystalline α-amylase from hog pancreas, human pancreas, human saliva, *Bacillus subtilis*, and the α-amylase of purified malt possessed the same ratio indicating that, although the enzymes differ chemically, they exhibit the same type of action. The presence of β-amylase in a solution may also be detected by determining the ratio. 17 references. J.W.S.

BOURNE, E. J., HAWORTH, NORMAN, MACEY, A., and PEAT, S. The amylolytic degradation of starch. A revision of the hypothesis of sensitisation. J. Chem. Soc.: 924-30 (July, 1948); *cf.* B.I.P.C. 14: 225.

An extension of the work of Haworth, Kitchen, and Peat (1943) on the amylolysis of starch has provided data which necessitate a revision of the tentative hypothesis then advanced to account for the "sensitization" of the limit dextrin-A by the action of salivary amylase. Dextrin-A is resistant to the hydrolytic action of β-amylase until it is "sensitized" by contact with salivary α-amylase. To explain this effect the suggestion was made that the function of the α-amylase in sensitization was the scission and resynthesis of the 1,6-glucosidic linkages constituting the cross (or polymeric) links in the branched structure of dextrin-A (and of amylopectin from which it is derived). The experimental results described in this communication cannot be reconciled with the suggested mode of action of α-amylase but are explicable in terms of the concept that α-amylolysis is the hydrolytic scission of the normal 1,4-glucosidic bonds of "inner" chains (an inner chain is a chain of 1,4-linked α-glucose members situated between two branch points). Contrary to the authors' earlier view it would seem that the cross linkages of branched structures like amylopectin are resistant to hydrolysis by α-amylase. Sufficient information is not yet available to enable a decision to be reached on the molecular constitution of ramified structures, such as amylopectin. The properties of amylopectin can be equally well interpreted in terms of the branched or laminated formulation of Haworth and Hirst which was the simplest expression capable of illustrating the facts then available, or by an extension of this idea in which more than one cross linking is introduced. The extreme case is illustrated by the formulation by K. H. Meyer of an irregular model with multiple branching of chains. Some comments are made on Myrbäck's hypothesis concerning the biogenesis of starch. E.S.

KRAJČINOVIĆ, M. Contribution to the knowledge of oxidized starch. Experientia 4, no. 7: 271-2 (July, 1948). [In German; abstract in English] *cf.* B.I.P.C. 17: 408; 18: 226.

Using potato starch, the author has verified the presence of keto and carboxyl groups in oxidized starch. The procedure outlined for the quantitative determination of the keto group in starch is identical with, and that of the carboxyl group similar to the earlier procedures for determining these groups in oxycellulose. R.R.

LAMPITT, L. H., FULLER, C. H. F., GOLDENBERG, N., and GREEN, G. H. The fractionation of potato starch. Part VI. The retrogradation of potato starch fractions. J. Soc. Chem. Ind. 67, no. 5: 179-84 (May, 1948); *cf.* B.I.P.C. 18: 869.

The retrograding properties of cold-water soluble and hot-water soluble fractions of potato starch have been investigated under varying conditions of temperature and concentration and have been found qualitatively not unlike those of the wheat starch fractions investigated previously (*cf.* B.I.P.C. 11: 333). The quantitative differences between the retrograding properties of the two sets of fractions appear to be governed by their contents of amylose and amylopectin on the one hand, and by the differences in the nature and distribution of small quantities of phosphorus present in the two starches on the other. 27 references. E.S.

NOELTING, G., and BERNFELD, P. Amylolytic enzymes. III. Determination of β-amylase activity and a method for checking the absence of α-amylase. Helv. Chim. Acta 31, no. 1: 286-90 (Feb. 2, 1948). [In French] *cf.* B.I.P.C. 18: 327.

A rapid accurate method is described for the determination of β-amylase activity. It consists of the photometric measurement of the maltose formed (*cf.* Sumner, J. Biol. Chem. 62: 287-90 [1924]) when the enzyme acts upon potato amylopectin. Up to about 10% degradation of the amylopectin, the activity of the amylase is directly proportional to the extinction value obtained and, therefore, to the quantity of maltose formed. The activity of the β-amylase is expressed in milligrams of maltose hydrate ($C_{12}H_{22}O_{11} \cdot H_2O$) formed in three minutes at 20° C. in a 0.5% amylopectin solution of pH 4.8. The method is also suitable for determining the activity of α-amylase, in which case the activity is expressed in milligrams of apparent maltose obtained under the above conditions. A method is also described for determining the presence of small amounts of α-amylase in preparations of β-amylase. This method depends upon the fact that β-amylase does not attack a pure limit dextrin, but that the dextrin becomes accessible to attack by β-amylase after having been treated with α-amylase. By this technique 0.01% of α-amylase may be detected in a mixture of α- and β-amylase. Experimental details are given. 10 references. J.W.S.

PUCHER, GEORGE W., LEAVENWORTH, CHARLES S., and VICKERY, HUBERT BRADFORD. Determination of starch in plant tissues. Anal. Chem. 20, no. 9: 850-3 (September, 1948).

Starch is extracted from a 50- to 250-mg. sample of dried plant tissue with perchloric acid as recommended by Nielsen (*cf.* B.I.P.C. 13: 334), precipitated with iodine, and recovered as starch, which is hydrolyzed and determined as glucose. The results are independent of the composition of the starch of different species with respect to amylose and amylopectin. Theoretical recoveries of glucose from pure potato starch are obtained; the experimentally determined factor is 0.90 with an uncertainty of ±1.2%. The precision of the method as applied to a variety of plant tissues is approximately 2%. 20 references. E.S.

STATISTICAL METHODS

RENNER, MAYNARD S. Some basic concepts of statistics and their application to simple industrial experimentation. Paper Trade J. 127, no. 9: 54-7 [T.S. 364-7] (Aug. 26, 1948).

Certain of the basic concepts of statistical methods are discussed in terms

of a simple experimental problem, particularly with the experimentalist who is not a trained statistician in mind. The problem discussed is to compare two different treatments in cases where the evaluation data are the "go" or "no go" type, rather than being measurements and thus fall into the binomial distribution. The binomial distribution, the nature of infinite populations and their descriptions in terms of a few simple numbers, as well as the relationship of laboratory data to infinite populations, are discussed. The null hypothesis is described and it is pointed out that it can never be proved, but can only be disproved. Then the subjects of the degree of risk and of confidence limits are discussed briefly, as well as the value of proper design of experiments. The problem of drawing inferences about populations from samples is discussed briefly and it is pointed out that the science of statistics has been developed in order to arrive at a more quantitative method of treatment of the problem of handling data. E.S.

STEAM TURBINES

ANDERSON, G. W. Industrial turbine maintenance. Paper Mill News 71, no. 35: 58, 61-2, 76 (Aug. 28, 1948).

With the rapid development of steam turbines for driving generating and mechanical equipment in industrial plants, there has been an increase in the size of the turbines used, operating pressures and temperatures, and the functions they perform. The maintenance program has become more involved and more important to the continuity of service. A well-trained maintenance supervisor is necessary to direct the work of general mechanics. A record must be kept of the condition of the equipment as found during each inspection and this should be consulted frequently; from this record should be set up a systematic schedule of outages of the power plant equipment for inspection and repair. Typical cases are given of changes in pressures and temperatures which reveal a maintenance condition. A regular schedule should be set up for testing the auxiliary oil pump and the condition of the oil in the turbine lubricating system. A general inspection requiring complete dismantling of the turbine should be supervised by the manufacturer's representative. A maintenance check chart for electrical equipment is included. R.R.

STRAW

ARONOVSKY, S. I., NELSON, G. H., ERNST, A. J., SUTCLIFFE, H. M., and LATHROP, E. C. Agricultural residue pulps—high-yield straw pulps for fine papers. Paper Trade J. 127, no. 11: 154-62 [T.S. 380-8] (Sept. 9, 1948); *cf.* B.I.P.C. 18: 790.

The pulp and paper industry of this country is becoming increasingly interested in the possibilities of using agricultural residue pulps for fine papers. The lower cellulose contents of the agricultural residues and the consequently lower yields of papermaking fiber generally produced from these residues have often put these materials at an economic disadvantage when compared with wood. The neutral sulfite process, which gives high yields of relatively strong, easy bleaching pulps from agricultural residues, should partly overcome this disadvantage. The present paper gives a more detailed study of this process. The data show that yields of 52 to 55% of screened pulp were obtained by cooking sound wheat straw with 8% sodium sulfite and 2 to 3% sodium carbonate (on the basis of dry straw) for 2 hours at 170° C. (100 p.s.i.), using a total liquid to straw ratio of 7:1. The unbleached pulp had a maximum bursting strength (Mullen) of 85 to 95 points, a tensile strength at maximum burst of about 170 grams per ream pound, and a freeness (Schopper-Riegler) of 400 to 500 ml. The relatively low tear resistance of 40 to 60 grams per ream pound, which is a result of the short-

ness of the wheat straw fiber, was somewhat greater than that found for hardwood soda pulp. Bleaching these neutral sulfite straw pulps to a brightness of 70 and above required 5 to 7% total chlorine and reduced the yields to approximately 49 to 53% of the original weight of dry straw. Bleaching also enhanced the strength properties of the pulps, particularly the bursting strength and folding endurance. The bleached pulps hydrated more readily, as indicated by the reduced beating periods required to reach maximum burst, than the unbleached pulps. An analysis of the data indicates that, on the basis of the pulp yields, bleach requirements, and strength characteristics, 6 to 8% sodium sulfite and 2 to 4% sodium carbonate give the optimum results under the condition employed in these studies. This bleached neutral sulfite straw pulp should be completely satisfactory for blending with wood and other paper pulps in the production of fine specialty papers such as writing, book, magazine, and litho, as well as in art papers and bristol boards. The inclusion of the straw pulp in the furnish should result in lower beating and refining costs and should produce papers with better formation and improved strength and printing characteristics. 12 references. E.S.

EKWALL, AXEL. Straw as raw material for board manufacture in the United States. Svensk Papperstidn. 51, no. 16: 360-1 (Aug. 31, 1948). [In Swedish]

Recent developments in straw utilization in the United States are reviewed briefly. E.S.

STREAM POLLUTION

CHIPMAN, WALTER A., JR. Physiological effects of sulphate pulp mill wastes on shellfish. Paper Trade J. 127, no. 12: 47-9 [T.S. 389-91] (Sept. 16, 1948).

The effluents of sulfate pulp mills contain substances which are toxic to aquatic life. If present in sufficiently strong concentration, sudden death may result, whereas long continued exposure to weaker concentrations may be evidenced in physiological changes within the organism which interfere with its well being. Continued exposure to a harmful environment will be experienced particularly by those forms which are sedentary and unable to avoid such situations. Tests were made on the action of mill effluents in the York River, Va., where an environment existed which caused a severe decline in oyster production. It was found that the addition of kraft black liquor to sea water reduced the hours that oysters remained open and decreased the rate of pumping of water through the gills, resulting from an interference with the mechanism of ciliary activity of the gill epithelium. Strong kraft soap, weak soap, and black liquor were found to contain this physiologically active material in great amount. It tends to concentrate in the soap portion of the mill products. Its exact nature has not been determined in the present paper. Erdtman, however, has definitely shown that the toxic substance obtained from the European pine, *Pinus sylvestris,* is a dioxystilbene present in the heartwood of the tree. Oxidation of the weak black liquor makes the material ineffective; it can be precipitated from mill liquors by salts. 17 references. E.S.

CRAWFORD, STUART. Oxygen balance studies of a typical swamp stream. Sewage Works J. 20, no. 5: 876-80 (September, 1948).

The author reports on studies of a swamp stream, the Blackwater River, in Virginia, during which he sought to determine the natural dissolved oxygen fluctuations of the stream, study the measurable effects of sulfate pulp and paper mill discharges on the stream, and select methods for reducing these effects to an acceptable level. It seems that the existing concepts of

4.0-5.0 p.p.m. of dissolved oxygen for the proper support of aquatic life are not applicable to swamp streams, where such life has been acclimated to the naturally lowered conditions. The author believes that an average of 2.5 p.p.m. of dissolved oxygen and a minimum of 2.0 p.p.m. would suffice. R.R.

LAWRANCE, WALTER A. Determination of the time of passage of pollution in the Androscoggin River and Pond. Sewage Works J. 20, no. 5: 881-96 (September, 1948).

A summary is given of conditions existing in the watershed system of the Androscoggin River and Pond, in both of which sulfite waste liquor and cellulose fiber from paper mills with some sewage constitute the major pollution load. A description is given of the method of determining the oxygen consumed from potassium permanganate in acid solution by the soluble constituents present in the water, which was used to obtain the times of passage of pollution for a distance of 112 miles. This information was necessary for calculating the natural self-purification capacities under different pollution loads. R.R.

WESTON, ARTHUR D. Water pollution by municipal and industrial wastes. Paper Mill News 71, no. 37: 32, 34, 40 (Sept. 11, 1948).

The author quotes different statements by various authorities calling for better control of stream pollution and mentions several measures taken in the eastern states for attaining this goal. Since 1897 about 100 bills have been introduced in Congress in this regard but all failed to pass. The main reason for this failure is probably the fear of providing an extension of Federal control. The author believes that the problem can be solved without Federal interference, if it is attacked in a sane and intelligent manner, whereby public health is adequately protected on one hand, and by measures which will not make it impossible for industry to survive on the other. However, remedial programs must be such as can be properly financed. E.S.

SUGARS

AUERNHEIMER, A. H., WICKERHAM, L. J., and SCHNIEPP, L. E. Quantitative determination of hemicellulose constituents by fermentation. Anal. Chem. 20, no. 9: 876-7 (September, 1948).

The D-xylose and L-arabinose in hydrolyzates of hemicelluloses from agricultural residues can be quantitatively determined by fermenting solutions of the uronic acid-free sugars with *Hansenula suaveolens* (NRRL No. 838) and *Candida guilliermondii* (NRRL No. 488). *H. suaveolens* selectively utilizes D-xylose and *C. guilliermondii* utilizes both sugars completely. By the determination of the copper-reducing values of unfermented and fermented samples, the percentage of each sugar may be calculated. These data confirm those obtained by Wise and Appling (*cf.* B.I.P.C. 14: 189-90; 15: 302-3). E.S.

SULFATE MILLS

ANON. To bleach in Alaska. Pulp & Paper 22, no. 10: 34-5 (September, 1948).

If no unforeseen hindrances develop, construction work will begin next spring on the first pulp mill ever built in Alaska. According to present plans, the mill will have an initial capacity of 300 tons daily of high alpha sulfite pulp, 100% bleached. A six-digester pulp mill and bleach plant are to be built at Ward's Cove, north of Ketchikan. The present plans call for bleach-

ing in Alaska, although serious thought has been given to having the bleach plant in the eastern or western United States. It is understood that the mill production is to cover the future expansion of the American Viscose Corp., not current needs. The mill is to be operated by the newly formed Ketchikan Pulp & Paper Co., most of the executives being also officers of the Puget Sound Pulp & Timber Co., with the financial backing of the American Viscose Corp., which has arranged to take all the pulp. E.S.

ANON. Weyerhaeuser has modernized its Longview Pulp Division. Paper Ind. 30, no. 6: 873-8 (September, 1948); *cf.* B.I.P.C. 18: 401.

Supplemented by an air view of the Pulp Division, a description is given of the magnesium oxide-base sulfite process to which the old calcium sulfite mill is being converted and of the new kraft mill and bleach plant, which went into production in August, 1948. The kraft mill is designed to make high-quality bleached pulp primarily from material which was previously used as hogged fuel or left in the woods as waste. It represents a further step in the fuller utilization of the forest products, including cull logs, relogging and prelogging, sawmill waste, and farmer wood of any species. The use of hydraulic barkers is another step in this direction, effecting wood savings of approximately 20%. In the bleach plant, six separate stages are used, all bleaching, except the first two stages, being done at high densities. Most of the equipment is tile-lined concrete. A Minton vacuum drier is used for drying the pulp without subjecting it to excessively high drier surface temperatures. The pulp is cut into sheets which are automatically stacked and pressed into compact bales, wrapped and tied with wire, and conveyed to the shipping room. E.S.

SULFITE PROCESS

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Standard terms used in the sulphite pulping process. Paper Trade J. 127, no. 9: 60 [T.S. 370] (Aug. 26, 1948).

The text of TAPPI Tentative Standard 0 406 p-48 is given, in which the definitions for 19 terms commonly used in the sulfite process are explained. E.S.

SULFITE PROCESS—NEUTRAL

MCGOVERN, J. N., and KELLER, E. L. Some experiments in sodium sulphite pulping. Pulp Paper Mag. Can. 49, no. 9: 93-100 (August, 1948).

Pulping with sodium sulfite, one of the earliest-mentioned chemical pulping processes, has not been used commercially to any extent despite the high quality of the pulp, mainly because of chemical recovery complications. Recently renewed interest in the process, probably caused by the possibility of employing it for little used wood species, has made timely the presentation of results of some experiments in sodium sulfite pulping at the Forest Products Laboratory, Madison, Wis. These experiments were as follows: Black spruce chips were pulped with sodium sulfite buffered with sodium sulfide, and the effects on pulp yield and on quality of variations in pulping time, temperature, and liquor concentration were determined. The black spruce sodium sulfite pulps were compared with acid sulfite and sulfate pulps from the same kind of chips, and were found to be produced in 15% lower yield, to be nearly as bright as the acid sulfite pulps (unbleached), to be as strong or stronger than the sulfate pulps, and to require 25% more chemical on a sodium oxide base and much longer pulping times than the sulfate pulps. Sodium sulfite pulps were also prepared from white spruce, Engelmann

spruce, balsam fir, aspen, and black maple. The results for the softwood pulps were all similar, whereas the hardwood pulps were produced in appreciably higher yields and brightnesses, but were considerably weaker than the softwood pulps. The hardwood sodium sulfite pulps, however, after some beater processing, compared favorably in strength with softwood acid sulfite pulp. Jack pine chips were pulped with sodium sulfite buffered with sodium bicarbonate and gave pulps in yields varying from 48 to 78%. Maximums in bursting, tearing, and tensile strengths were obtained in pulps made in yields of 55 to 60%, but the decreases in these strengths up to 78% yield were only 25% of the maximum values. The highest folding-endurance values were shown by the lowest-yield pulp. A high-yield (56.5%) sulfate pulp from the same chips had the same strengths as the neutral sodium sulfite pulp made in the same yield except for folding endurance, which was twice as high for the sulfate pulp. 20 references. E.S.

SULFITE WASTE LIQUOR

BRUNES, B. Optimum sulfite waste liquor recovery in the manufacture of sulfite alcohol and for evaporation (for obtaining fuel). Svensk Papperstidn. 51, no. 15: 336-42 (Aug. 15, 1948). [In Swedish; German and English summaries]

In Sweden, the amount of waste liquor to be withdrawn from sulfite digesters is usually determined from the angle of economic alcohol production or, when no alcohol is being manufactured, by the need for certain amounts of hot water produced by heat exchange with the hot waste liquor. The evaporation of sulfite waste liquor for producing fuel is now becoming a further factor of importance in the economics of waste liquor recovery. A plant for the evaporation of sulfite waste liquor should not be based exclusively on the amount of liquor normally withdrawn from the digesters. The problem of the "economic" amount of waste liquor should be studied. This might justify considerable changes in the recovery plant. Even where an alcohol plant is in operation, it will be worth while to take the economic limits of waste liquor recovery by evaporation only into consideration. When these data are available, it will be possible to compare the economics of the three alternatives: alcohol production, evaporation, and a combination of alcohol production and evaporation. General data for Swedish conditions and coal prices are given, supplemented by ten diagrams and one table. However, it is emphasized that the economical limit for liquor recovery varies from plant to plant, depending upon the local installations, so that each plant presents an individual problem, before a final decision can be made. E.S.

PEARL, IRWIN A. Utilization of sulfite waste liquor. Chem. Eng. News 26, no. 40: 2950-3, 3006 (Oct. 4, 1948).

From tabulated data on the composition of sulfite waste liquor solids, it is evident that about 1,250,000 tons of lignin and 500,000 tons of sugars are discarded annually by domestic sulfite mills. Decreasing national resources call for the use of such products. Proposed methods for the utilization of sulfite waste liquor cover processes for recovering heat and/or inorganic chemicals, utilizing the physical and/or chemical properties of one or more constituents, and recovering or producing organic chemicals or products. Each of these groups is discussed. Under organic chemicals or products, the author considers the use of the liquor in fermentation to produce ethyl alcohol, fodder yeasts, and products such as acetone, butanol, lactic acid, penicillin, hydrogenated lignosulfonates to be mixed with other compounds and used as solvents, and vanillic acid esters; the production of vanillin by the Marathon-Howard process is discussed at some length. Under heat and chemicals recovery, the author considers the difficulty of recovery from

calcium-base sulfite waste liquor, the utilization of magnesium-, ammonium-, and sodium-base liquors, and the Howard process for recovering pulping chemicals, as well as lignosulfonate, from sulfite waste liquor. There are many proposed uses for sulfite waste liquor based on the physical properties of the whole waste liquor or those of its two principal constituents, among them adhesives, insecticides and fungicides, road treatment agents, detergents in the textile industry, lubricants, water-dispersion paints, concrete mixes, ceramics, electroplating agents, well-drilling lubricants, flotation agents, printing inks, and rubber reinforcing agents. Whole sulfite waste liquor is a good organic reducing agent and is useful in the application of vat dyes; in combination with other products, it forms water-soluble basic alkali salts with good foaming properties, and finds use in soaps, boiler scale inhibitors, tanning materials, fertilizers, and water softeners. 23 references. R.R.

WURZ, OTTO, and SWOBODA, OTTOKAR. Studies of the neutralization processes of sulfite waste liquors. Textil-Rundschau 3, no. 6: 201-6 (June, 1948). [In German] *cf.* B.I.P.C. 16: 416.

To study the difficulties occurring during the neutralization of sulfite waste liquor, the authors investigated the effect of various factors upon the solubility of calcium sulfite. Because the small amount of organic matter (apart from lignosulfonic acid) present in sulfite waste liquor—such as furfural, methyl alcohol, ether extracts, etc.—exerts no effect upon the neutralization, the solubility of calcium sulfite in water at various temperatures and pH values, in buffered solutions, and in the presence of sugars, lignosulfonic acid, and acetic acid was studied. The results of these preliminary investigations are given in several curves and tables; the studies are being continued. F.E.B.

SURFACE PHENOMENA

BUCHANAN, A. S., and HEYMANN, E. Notes on the electrokinetic potential of cellulose and on electrokinetic equations. Trans. Faraday Soc. 44, no. 5: 318-22 (May, 1948).

A comparative discussion is given of Neale's equation for the streaming current and of the modified Helmholtz-Smoluchowski-Briggs equation for the streaming potential. For nonswelling solids, Neale's equation is identical with the Helmholtz-Smoluchowski equation, provided that the specific conductivity of the liquid while it is contained in the porous plug (or capillary) is inserted in the latter equation (modification by Briggs). The authors have used the two equations for calculating the electrokinetic potential from data of the streaming potential of various samples of cellulose and oxycellulose, which show an appreciable amount of swelling and a wide variation of surface conductivity. There is little difference between the numerical values of the electrokinetic potential calculated by the two equations. The influence of swelling on electrokinetic properties is discussed. Results obtained by Neale and Peters (*cf.* B.I.P.C. 17: 155) are discussed and compared with those of previous investigators. 11 references. E.S.

TALL OIL

WHEELER, D. H. Tall oil. Progress thru Research 2, no. 4: 1-4 (Summer, 1948).

The author gives the derivation of the word tall oil, briefly discusses the structure of pinewood, and describes the process of manufacture and its uses. Tall oil is a mixture generally composed chiefly of fatty and rosin acids, with 5-10% of nonacidic or unsaponifiable matter. The fatty acids are

largely oleic and linoleic acid, with a small amount of palmitic acid. The rosin acid is chemically similar to ordinary rosin, but often contains a viscous liquid rosin. Although it is the cheapest of the organic acids—two to four cents a pound—its color and odor and the fact that it is a mixture have been serious drawbacks to its wider use. However, its uses have grown steadily in number and are now extremely diversified. Tall oil soaps have been used widely for cleaning purposes, asphalt emulsions for road surfaces, insecticides, herbicides, emulsion paints, cutting oils, and the flotation separation of minerals. Tall oil alone produces poor drying oils, but it may be used successfully to replace some of the usual drying oils for certain protective coatings. Recently, improved coatings have been made through the chemical modification of tall oil. Fractional distillation yields a fatty acid fraction containing only 5% rosin acids and a rosin fraction containing some fatty acids, which is superior to the crude oil for making soap. The remaining residue or pitch is useful in certain types of paint oils and for dark asphalt tiles. Oil-modified alkyd resins—combinations of resin and the fatty acids of the oil—have resulted in an insoluble durable protective coating that is highly resistant to water, soap, and solvents. R.R.

TARIFF

BULLOCK, WARREN B. The paper industry a victim of reciprocity. Paper Ind. 30, no. 6: 879-80 (September, 1948).

The author shows that the paper industry has been the chief target, among all major industries, of efforts to reduce tariff barriers through Reciprocal Trade Agreements. The first reciprocal agreement negotiated by this country placed newsprint on the free list; not only did the newsprint industry migrate to Canada, but mills formerly making this grade were forced to dismantle their plants or turn to the manufacture of other grades. The trend seen in the newsprint field is now in evidence in closely related grades, such as groundwood printing papers. Some grades, formerly made in the United States, are now principally imported from Canada; other grades are migrating at an accelerated rate. Some of the specific results of the program to reduce duty rates are shown in the examples of increased imports of printing papers, plain paperboards, tissue paper, carbon paper, vegetable parchment, simplex decalcomania, kraft wrapping paper, sulfite and other wrapping paper, and standard newsprint, resulting from various trade agreements. E.S.

TRANSPARENT CONTAINERS

ANON. Ice cream in acetate. Modern Packaging 22, no. 1: 100-1 (September, 1948).

A New York luxury confectioner has introduced a French ice cream in a pail-shaped rigid cellulose acetate container, through which the color of the product may be seen. The container, costing six times as much as the conventional type, is made of 0.0075-gage plastic, has a beaded top and bottom, is cemented down the side, and has a recessed groove at the rim to accommodate a snap-disk paper board lid with a thumb tab for opening. The containers have shown good resistance to heat and cold without cracking. When the supply is sufficient, the company plans to put the transparent containers in cylindrical cartons with dry ice as they are sold. R.R.

ANON. Sense for humus. Modern Packaging 22, no. 1:132-3 (September, 1948).

Peat humus, the moisture content of which must be kept at a certain percentage to maintain bacteria content, is now being successfully packaged in heat-sealed polyethylene bags of double thickness. The bags have a very

low water-vapor transmission rate, are chemically inert and pliable, will not crack open or stiffen with age, and permit a view of the contents. In the larger sizes, the humus is packaged in multiwall kraft bags with polyethylene liners. R.R.

TURPENTINE

SHEARON, WILL H., JR., PATTON, E. L., and SHINGLER, G. P. Continuous distillation of gum turpentine. Ind. Eng. Chem. 40, no. 9: 1695-1702 (September, 1948).

Following a history of developments in the naval stores industry in this country, the authors discuss the preparation of gum rosin, the continuous distillation process (a development of the past year), and future prospects of the industry. Included are a flow chart of the Olustee gum-cleaning method and the new continuous still process, and detailed drawings of the flash chamber and stripping column of the latter. Data are tabulated giving the U. S. production of naval stores from July, 1947, through June, 1948, and consumption for the first half of 1948, a comparison of turpentine still types, and the average operating conditions for the new process. 18 references. R.R.

VANILLIN

KÜRSCHNER, KARL. Remark concerning the preparation of vanillin from sulfite waste liquor. Cellulosechem. 19, no. 6: 136-7 (November/December, 1941). [In German] *cf.* B.I.P.C. 13: 144-5.

In a polemical reply to the article by Lautsch, the author gives a brief history of the development of the preparation of vanillin from sulfite waste liquor. 20 references. F.E.B.

WASTE PAPER

BETTENDORF, HARRY J. Wastepaper statistics. Fibre Containers 33, no. 8: 115-16, 118, 120, 125-6, 128-30 (August, 1948); *cf.* B.I.P.C. 18: 125-6.

Waste paper consumption in 1947 was 7,845,000 tons, representing a recovery rate of about 35% of the paper and board which goes into consumption. Of this amount, 6,173,800 tons went into paperboard, 525,100 tons into roofing, and 1,146,100 tons into paper. Recently, waste paper has represented about 55% of the content of all boards (as compared with 60% during the war years) and 15% of the content of all papers (prewar 12%). For various reasons (which are outlined), expanded fiber needs for paperboard in the future will have to come from waste paper sources, even if this trend may not become evident in 1948 and 1949, because the substantial new postwar kraft capacity is coming into production. Expansion of paperboard production in the North would seem to call for about 800,000 tons of waste paper for each million tons of board. Expansion in the paper industry, on the other hand, would seem to call for about 180,000 tons of waste paper for each million tons of paper. At a predicted 25 million rate of production, the possible future waste paper consumption of 9,861,000 tons would represent a recovery rate of about 37%. Supplemented by numerous tables and diagrams, the flow of waste paper and the normal consumption-stock-price relation are discussed. E.S.

WELDING

COBB, ADRIAN L. Making chipper knives at the mill. Pulp Paper Mag. Can. 49, no. 9: 78-80 (August, 1948).

A process for making chipper knives in a southern board mill is described;

it consists essentially of arc welding a very hard cutting edge on a relatively soft base plate and grinding to the desired dimensions. The details of the procedures are outlined, supplemented by diagrams. The knives are produced by the maintenance crew of the mill with equipment commonly found in all pulp and paper mills. E.S.

WET STRENGTH

JULLANDER, INGVAR. Treatment of paper with silicon esters. Nature 162, no. 4112: 300-1 (Aug. 21, 1948).

Ordinary filter paper exposed to the vapors of a polymer silicon ethyl ester for 16 hours at 120° was completely impermeable to water for 11 hours. Immersion in the liquid ester for 4 to 66 hours produced a paper with regularly increasing water impermeability, improving from 1 to 50 hours. Unsized kraft gave similar results; experiments with sized paper were unsuccessful. The wet strength of treated unsized kraft was three to seven times that of untreated paper. It is also possible to carry out the treament so that no water repellency is observed, but the wet strength is increased considerably. With treated filter papers, it is possible to filter 10 to 45% sodium hydroxide solution. The water-repelling effect is probably similar to that observed when paper is treated with silicones (*cf.* B.I.P.C. 18: 259); the increase in wet strength is thought to be caused by cross links of silicon atoms formed between the cellulose chains. R.R.

RESINOUS PRODUCTS & CHEMICAL COMPANY, *Philadelphia, Pa.* Uformite 475—new wet strength resin. Resinous Reptr. 9, no. 5: 8-9 (September, 1948).

Good absorbency, high wet strength, and economy may soon be combined in paper through the use of a new urea-formaldehyde water-soluble resin, Uformite 475. Although of interest to all paper manufacturers, this fact is especially important for producers of paper towels from sulfite-groundwood stocks. Tests show that a drop of water of standard size and at a controlled temperature will be absorbed by paper in 40 seconds if no wet-strength resin was used, in 43 seconds if Uformite 475 was added, and in 209 seconds if one of the older wet-strength agents was employed. A 70% sulfite, 30% groundwood stock fortified by Uformite 475 becomes stronger than 100% sulfite stock. To produce one ton of toweling with a 300% wet-strength increase, $4.44 worth of Uformite 475 is needed. When added to refined pulp, the resin should be diluted; when added at the beater, dilution is unnecessary. Hydrochloric acid is the preferred catalyst, although aluminum sulfate can be used. Broke recovery requires no special precautions. R.R.

WILFINGER, H. Basic high polymers used in the paper industry. Wochbl. Papierfabr. 76, no. 6: 135-8 (June, 1948). [In German]

Ethyleneimine, boiling at 56° C., was converted into a polymer (I) which was still water soluble. The action of (I) on the paper sheet resulted in improved wet-rub strength and wet-tensile strength. The percentage of retention of (I) depends upon its basicity, D. P., and also on the type of cellulosic material with which it makes contact. A bleached sulfite pulp, for instance, with 85.5% α-cellulose, after impregnation with a (I) solution followed by thorough washing, retained 2.4% (I), whereas purified cotton linters (99.7% α-cellulose), with presumably few carboxyl groups, retained only 0.45%. Bleached sulfite pulp when treated with (I) showed a greatly lowered swelling capacity, with concomitant decrease in water retention. A pulp, when treated with (I) and hydrated, no longer gave the typical blister test. The wet strength of the sheet usually reached a maximum after the addition of 1-2% (I), which makes it probable that the effect of (I) is

caused by its interaction with the cellulose (rather than its addition *per se*). (I) augments the dewatering of the stock and the degree S.-R. drops; this drop is greater, the milder the preceding beating operation. Decreases in hydration capacity caused by electrolytes or similar causes (as previously recorded in the literature) appear to involve a different mechanism from that of (I), the reaction of which seems to be irreversible. Retention of (I) by the fiber may be measured quantitatively by means of Kjeldahl nitrogen determinations or colorimetrically by use of a suitable acid dye. L.E.W.

WETTING-OUT AGENTS

NOLL, AUGUST. Comparative study of the activity of wetting agents toward a test paper. Wochbl. Papierfabr. 76, no. 7: 163-5 (July, 1948). [In German]

The Netzometer (I) used in testing the wettability of papers has been described previously (*cf.* B.I.P.C. 18: 698-9). The author extended the use of (I) to a comparative study of the effectiveness of various commercial wetting agents, detergents, and textile dressing agents. The reagents (10 grams/liter) were applied to a specific test paper under the usual conditions. Tabulated data are given for 20 different agents of this type which varied widely in their efficacy. For example, Igepal W acted within 14 seconds, whereas Lamepon A failed to wet the strip within 3600 seconds. Marked changes in wetting action were noted when some of the agents were extracted with alcohol prior to use. Thus Nekal A—which causes wetting within 63 seconds—required 574 seconds after alcohol extraction. On the other hand, Igepon A paste—which required more than one hour to wet the sample—acted within 30 seconds after alcohol extraction. In all cases the wetting tests were made in triplicate and close checks were obtained. A sketch of the equipment is included. 25 references. L.E.W.

WOOD—EXTRACTIVES

PEW, JOHN C. A flavanone from Douglas-fir heartwood. J. Am. Chem. Soc. 70, no. 9: 3031-4 (September, 1948).

A new flavanone, the 3,3',4',5,7-pentahydroxy derivative, was isolated from Douglas-fir heartwood. The flavanone was oxidized to quercetin by air and reduced to eriodictyol with zinc dust and hydrochloric acid. Preparation of the racemic flavanone was accomplished by reduction of quercetin with sodium hydrosulfite. Naringenin and another new flavanone, 3-hydroxynaringenin, were found in coigue and black cherry heartwoods. 27 footnotes. E.S.

YEAST

HARRIS, ELWIN E., and JOHNSON, MARTHA C. Microbiological utilization and disposal of wood-processing wastes. Paper Ind. 30, no. 6: 940-2 (September, 1948).

The authors describe work conducted at the Forest Products Laboratory on three wood-processing wastes (sulfite waste liquor, board mill waste, and waste from alcohol manufacture from wood hydrolyzates), in which yeast was used as the organism for the utilization of the wastes which, in all cases, are oxygen-consuming and present disposal problems. The studies indicated that sulfite waste liquor may be fermented, producing about 20 gallons of alcohol per ton of pulp with a 40% reduction in biological oxygen demand; when used to grow yeast, 100 to 150 pounds of yeast per ton of pulp may be obtained, with a 50-60% reduction in biological oxygen demand. Processing water from the production of fiberboard may be reduced in volume and the sugars utilized to produce 75-85 pounds of yeast per ton of board,

thereby reducing the biological oxygen demand to one-fourth the original value. Pentose-containing liquors from the production of alcohol from wood hydrolyzates may be used to produce 90 pounds of yeast per ton of wood, resulting in a 40% drop in biological oxygen demand. 13 references. E.S.

JOHNSON, MARTHA C., and HARRIS, ELWIN E. Acclimatization of various yeasts to wood sugar. J. Am. Chem. Soc. 70, no. 9: 2961-3 (September, 1948).

An investigation of the ability of 20 strains of yeast (*Torula, Mycotorula, Candida, Hansenula, Saccharomyces,* etc.) to be acclimatized for yeast propagation and alcohol fermentation on untreated 5% wood hydrolyzate showed that many strains of yeasts can be adapted for such purposes by transfer of the yeast to a fresh sugar solution each 24 hours. Growth and alcohol production were inhibited in the first few transfers, but the inhibiting effect was overcome by the twelfth transfer and the yeast continued to show a high activity during subsequent transfers. When yeast is allowed to stand in contact with the spent liquor for 72 to 96 hours, a loss in activity occurs, which requires several transfers to overcome. 13 footnotes. E.S.

Patent Section

Although the abstracts of the United States patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. The abstracts of the Canadian patents are prepared from the claims published in the* Canadian Patent Office Record. *In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents are available only as manuscript or photostatic copies. They are furnished by the Commissioner of Patents, Ottawa, Canada. An estimate of the cost of a patent should be obtained in advance of the order.

ADHESIVES

MURRAY, THOMAS F., JR., and SHARRARD, GEORGE F. Heat-sealing adhesive tape. U. S. patent 2,448,638. Filed Oct. 1, 1943. Issued Sept. 7, 1948. 4 claims. Assigned to Eastman Kodak Company.

The heat-sealing adhesive consists of a mixture of a condensation product of one mole of melamine and three moles of formaldehyde and a partially hydrolyzed polyvinyl acetate (containing an acetate content equivalent to from 70 to 80% by weight of the partially hydrolyzed homopolymeric vinyl acetate), the melamine constituting from 8 to 20% by weight of homopolymeric vinyl acetate. The adhesive may contain a softener (e.g., *N,N*-diethylacetamide) and a detergent. The adhesive can be applied to paper, regenerated cellulose sheeting, and the like. C.J.W.

BARK

PAULEY, ROBERT D. Separation of pure bark fibers from finely comminuted bark. U. S. patent 2,446,551. Filed Oct. 19, 1945. Issued Aug. 10, 1948. 7 claims. Assigned to Weyerhaeuser Timber Company.

Douglas fir bark is passed through a hammer mill, partially dried by hot air, screened to remove fines, finely comminuted in a ball mill (during which the material is further dried), and screened, the fractions representing coarse cork, fine cork, and pure bast fiber. The fibers vary from 0.016 to 0.051 inch in length and from 0.0016 to 0.0055 inch in diameter. C.J.W.

BARKERS AND BARKING

SCHNYDER, AUXILIUS P. Debarking apparatus. U. S. patent 2,448,689. Filed Oct. 16, 1944. Issued Sept. 7, 1948. 4 claims.

A barking machine consists of a combination of a rotary drum provided with debarking instruments and log guide means at one end of the drum. The log guide includes upper and lower guide rolls biased toward a central axis. Another construction has sets of log guides at each end of the drum. C.J.W.

BLEACHING—GROUNDWOOD

CRONIN, HOWARD J. Bleaching process. Canadian patent 451,225. Filed Dec. 11, 1944. Issued Sept. 14, 1948. 4 claims. Assigned to International Paper Company.

Mechanical pulp (at a consistency of 2.5 to 5%) is treated with 0.5 to 1.5% (of the dry weight of the pulp) zinc hydrosulfite with a minimum of agitation and the mixture is maintained at about 100° F. for three to five hours. C.J.W.

BOARD, BUILDING

CAMPBELL, ROBERT C., and CAMPBELL, DONALD. Board for buildings, furniture, and the like. Canadian patent 451,275. Filed July 3, 1945. Issued Sept. 21, 1948. 7 claims.

The surface of a board is given one or more surface applications of a dilute thermosetting synthetic resin solution and then one or more applications of a more concentrated resin solution (which penetrates the board less deeply), after which the product is heated under pressure to reduce the thickness of the board and polymerize the resin. The board is in contact with a hard polished surface during the heat treatment. C.J.W.

CALCIUM CARBONATE

RAFTON, HAROLD R. Treatment of pigment comprising calcium carbonate. U. S. patent 2,447,532. Filed Dec. 27, 1946. Issued Aug. 24, 1948. 10 claims. Assigned to Raffold Process Corporation; *cf.* B.I.P.C. 18: 489.

A method of modifying calcium carbonate (especially that prepared by causticizing sodium carbonate with slaked dolomitic lime) to improve the properties of adhesive requirement, oil absorption, gloss-imparting quality, and/or spreading quality consists in directing an aqueous slurry of the pigment into the path of travel of a percussive member of a rotor element, the percussive member having a velocity of not less than 30 feet per second. Most of the test results given relate to the reduction of the adhesive requirement of the pigment; under maximum conditions of treatment, this may be nearly 50%. C.J.W.

CELLULOSE—OXYCELLULOSE

KENYON, WILLIAM O., and YACKEL, EDWARD C. Oxidation of cellulose. U. S. patent 2,448,892. Filed Jan. 1, 1945. Issued Sept. 7, 1948. 3 claims. Assigned to Eastman Kodak Company.

Airdry fibrous cellulose is immersed in a solution of nitrogen dioxide in carbon tetrachloride for 1 to 16 hours. The solution may contain from 1 to 50% of nitrogen dioxide and the degree of oxidation may vary from 1 to 25% of carboxyl groups. The oxidized product may contain from 0.1 to 0.5% nitrogen. C.J.W.

CELLULOSE ETHERS

RUPERTI, ANDREAS. Process for making alkali cellulose. U. S. patent 2,447,914. Filed June 20, 1944. Issued Aug. 24, 1948. 8 claims. Assigned to Ciba Limited.

Sulfite pulp (500 parts) in rolls is passed through a bath containing 50% sodium hydroxide at 80° C. (the time of passage is 5-6 seconds) and then pressed to 1200 parts by weight. The temperature may vary from 60 to 90° C., the time of passage from 0.5 to 20 seconds, and the concentration of

alkali from 20 to 50%. The operation can be continuous. Pulp from wood, straw, bagasse, cotton linters, and the like can be employed. C.J.W.

COOKING PROCESS

RICHTER, JOHAN C. F. C. Process of continuous digestion of fibrous materials. Canadian patent 451,018. Filed Feb. 23, 1944. Issued Sept. 7, 1948. 10 claims. Assigned to Aktiebolaget Kamyr.

In the continuous digestion of fibrous materials under pressure, the raw material is introduced into the digester at the inlet end, liquor is introduced at the same point to fill the digester completely, and the raw material and the liquor are passed in unison through the digester while heat is supplied and the mixture is maintained under a pressure higher than the vaporization pressure of the digester liquor at the maximum temperature prevailing in the digester. The pressure is controlled by the introduction of a compression liquor other than the digester liquor near the inlet end of the digester. The heat is supplied at a point intermediate the inlet and outlet ends of the digester. In a modification, the compression liquor is introduced at the bottom of the digester. C.J.W.

DIGESTERS—FILLING DEVICES

RICHTER, JOHAN C. F. C. Apparatus for charging fibrous material into a digester. Canadian patent 451,019. Filed Sept. 17, 1945. Issued Sept. 7, 1948. 5 claims. Assigned to Aktiebolaget Kamyr.

An apparatus is described for charging a fibrous material into the liquid-filled space of a digester under pressure. C.J.W.

FOLDING BOXES

BARNES, WILBUR L., and HARRISON, JAMES J. Dispensing container. U. S. patent 2,449,046. Filed May 9, 1946. Issued Sept. 14, 1948. 6 claims. Assigned to Michigan Carton Company.

A dispensing container comprises walls provided with overlapping inner, outer, and intermediate closure flaps adhesively secured together; the construction of each flap is described. C.J.W.

BUTTERY, KENNETH T. Collapsible covered container or box. U. S. patent 2,447,563. Filed April 11, 1947. Issued Aug. 24, 1948. 7 claims. Assigned to Sutherland Paper Company.

The patent covers a container for merchandising foods of various kinds. C.J.W.

MITCHELL, WILLIAM A. J. Pocket-type tissue container. U. S. patent 2,448,819. Filed Dec. 20, 1944. Issued Sept. 7, 1948. 2 claims.

The invention relates to a small envelope-like type of dispensing packet or carton for use in coin-controlled vending machines. It is designed for a limited number of folded tissues; one of the corners is readily tearable and removable to expose the folded corner portions of the tissues. C.J.W.

STONE, EDWARD. Carton having integrally formed cushioning means. U. S. patent 2,448,401. Filed Oct. 20, 1944. Issued Aug. 31, 1948. 2 claims.

A carton for packaging radio tubes and other fragile articles is provided with a resilient support for the contents; it is so designed as to be cut from a single blank. C.J.W.

LIGNIN

FARBER, EDUARD, and SCIASCIA, MATHEW. Method for improving chemical reactivity and adsorptive capacity of lignin from wood saccharification. U. S. patent 2,449,209. Filed June 12, 1947. Issued Sept. 14, 1948. 3 claims. Assigned to Timber Engineering Company.

Lignin is treated with 1-12% alkali (5-7% preferred) at temperatures between 20 and 100° C. The lignin swells in the alkali and is not readily filtered in this condition; however, the addition of certain salts (e.g., calcium chloride) changes the colloidal behavior of the product and it is filtered readily. In an example 100 grams of lignin was digested 12 hours at room temperature with 5 grams of sodium hydroxide in 400 grams of water; after dilution with one liter of water and the addition of 2 grams of calcium chloride, the lignin was filtered; the product weighed 270 grams, indicating a high water-holding capacity. The adsorptive capacity for phenol was 275 mg. per gram of dry lignin, as compared with 60 mg. for the untreated lignin. In another example, the temperature was 90° C. and the time one hour. C.J.W.

IRION, CLARENCE E. Liquid printing ink containing a lignin compound. U. S. patent 2,449,230. Filed July 25, 1945. Issued Sept. 14, 1948. 18 claims. Assigned to Margot Corporation.

A liquid printing ink is made of coloring matter and a binder dispersed in a hydrophilic liquid carrier containing water, the predominant constituent of the binder being a soda lignin. It is stated that any lignin can be used, although all the examples refer to soda lignin. The lignin can be fused with a thermoplastic resin, such as rosin, ester gum, Batu gum, dammar gum, alkyd-type resins modified by chemical combination with natural resin acids, and the like. The liquid carriers are organic compounds which exert a solvating action upon the lignin, typical of which are 2-amino-2-methyl-1,3-propanediol, diethylene glycol monoethyl ether, 2-methyl-2,4-pentanediol, formamide, and the like. Various compounds can be added to produce a waterproof ink. A number of formulas are given for inks to be used for various purposes. C.J.W.

MACHINERY—CONVERTING MACHINERY

CHAPMAN, FRED H. Mechanism for feeding sheets of stiff fibrous material. U. S. patent 2,449,690. Filed Aug. 21, 1945. Issued Sept. 21, 1948. 30 claims. Assigned to The International Paper Box Machine Company.

The invention relates to a blank feeding mechanism which involves a movable vacuum mechanism for bending or arching the end portion of a box blank away from the next foremost blank before deflection of the end portion toward the blank-forwarding mechanism, thus avoiding effective action of the suction mechanism upon the next blank. Other details of the machine are given. C.J.W.

HIRSCHHORN, LOUIS. Manufacturing and filling of essence containing packages for brewing beverages. U. S. patent 2,447,754. Filed June 24, 1940. Issued Aug. 24, 1948. 2 claims. Assigned to National Urn Bag Co., Inc.

A machine for the forming of tea bags and the like is claimed. C.J.W.

IRMSCHER, HANS O. Manufacture of essence containing packages for brewing beverages. U. S. patent 2,447,014. Filed Nov. 25, 1940. Issued Aug. 17, 1948. 2 claims. Assigned to National Urn Bag Co., Inc.

A machine for the manufacture of tea bags and like is described. C.J.W.

TENNENT, CHARLES B., SR. Machine for making containers. U. S. patent 2,448,198. Filed Aug. 26, 1943. Issued Aug. 31, 1948. 12 claims. Assigned to National Folding Box Company, Incorporated.

The patent covers an automatic machine for the high-speed production of so-called "click-top" containers, the top of which is normally retained and locked in a closed position by a yielding abutment flap arrangement which automatically engages the cover upon closing the container cover and may be disengaged by the application of a certain amount of force at the cover. C.J.W.

MACHINERY—CREPING MACHINE

WOOD, ARTHUR H. Apparatus for creping paper. U. S. patent 2,447,784. Filed June 4, 1945. Issued Aug. 24, 1948. 6 claims. Assigned to Simplex Paper Corporation.

A method and apparatus are described for creping paper transversely of the predominant fiber length or in both directions. The paper web is fitted between stretched springs which grip the paper and are permitted to contract, thus creping the paper. C.J.W.

MACHINERY—PACKAGING MACHINERY

WHITE, ROBERT. Paper roll heading machine. U. S. patent 2,448,478. Filed Dec. 7, 1945. Issued Aug. 31, 1948. 5 claims. Assigned to Williams & Wilson Limited.

The invention describes a machine for applying adhesive disks of paper or the like to the ends of a wrapped roll of newsprint or other paper. C.J.W.

MACHINERY—PAPER MACHINE

RUSSEL, ANDREW N. Paper making machine. Canadian patent 451,006. Filed March 19, 1947. Issued Sept. 7, 1948.

In the combination of a Fourdrinier wire and a breast board for supplying a stream of stock to the wire, means are provided for vibrating the breast board at a relatively high frequency and with a small amplitude of movement having a substantial component normal to the plane of the stream-supporting surface of the wire; this operation assists in the initial distribution of the fibers and their formation into a web while supported on the wire. C.J.W.

MACHINERY—PASTING MACHINE

CASS, THOMAS F., JR., KIRK, DOUGLAS, and LANIGAN, FRANCIS W. Apparatus for sealing containers. U. S. patent 2,447,997. Filed April 23, 1943. Issued Aug. 24, 1948. 7 claims. Assigned to Container Corporation of America.

In a machine for the continuous closing and heat sealing of the top flaps of cartons, the sealing is effected primarily by means of a traveling belt

substantially synchronized with the motion of the cartons and through which heat is transmitted to the top closure and then removed therefrom. A collar arrangement is provided for holding the cartons during the sealing operation and means for removing the sealed cartons from the carton pockets. C.J.W.

MACHINERY—REFINERS

ARPIN, EDMUND P., JR. Rotary refiner. Canadian patent 451,279. Filed March 20, 1947. Issued Sept. 21, 1948. 17 claims; *cf.* B.I.P.C. 18: 413.

In a rotary refiner including a rotor, a shaft, a pair of heads fixed thereon, rods extending between the heads, and refining elements pivotally mounted from the rods for radially outward swinging movement, the outward movement is limited by a disk freely mounted on the shaft. C.J.W.

MACHINERY—SCREENS

MATHEWSON, WILFRED F. Paper pulp screen. U. S. patent 2,450,838. Filed Jan. 26, 1945. Issued Oct. 5, 1948. 13 claims.

The screening means consists of two parallel walls separated by a small clearance space which is of sufficient size to permit the fine acceptable portion of the unscreened pulp to pass through; one of the walls is provided with a plurality of pockets or grooves, all of which open into the clearance space and into which the unscreened pulp is delivered by means other than the clearance space to certain of the grooves; the other grooves are connected to a screened pulp outlet. Means are provided periodically to flush the clearance space to remove unacceptable material. C.J.W.

MACHINERY—SLITTERS AND WINDERS

LEAS, LEO. Adjustable heads for paper winding reels. U. S. patent 2,449,398. Filed Feb. 13, 1946. Issued Sept. 14, 1948. 6 claims. Assigned to Lee Paper Company.

A winder is described which may be adjusted readily to webs of different widths. C.J.W.

MACHINERY—WIRES

DILLEY, DONALD C., and MCGREGOR, ROBERT R. Seam for woven wire fabrics. Canadian patent 451,082. Filed Feb. 20, 1947. Issued Sept. 7, 1948. 1 claim. Assigned to Lindsay Wire Weaving Company.

A method of soldering the warp wires is claimed. C.J.W.

MOLDED PULP ARTICLES

CHAPLIN, MERLE P. Moulded fibre article. Canadian patent 451,054. Filed June 10, 1947. Issued Sept. 7, 1948. 9 claims. Assigned to Chaplin Corporation.

A self-locking molded fiber egg carton consists of a carton body having a bottom provided, between the outer side walls, with a row of upstanding compartments forming knobs, the upper ends of which constitute cover supporting abutments positioned below the upper edges of the side walls, and integral covers hinged to the upper edges of the opposite side walls of the body and having flanges at their free edges adapted to engage one another facially with their free edges resting upon the abutments when the covers are closed. C.J.W.

PAPER—COATED

HERVEY, LAURENCE R. B., and WHITAKER, ALVIN C. Water-soluble coating composition for paper. U. S. patent 2,449,812. Filed Aug. 27, 1945. Issued Sept. 21, 1948. 1 claim. Assigned to the United States of America as represented by the Secretary of War.

A coating composition for paper contains (parts by weight): polyvinyl alcohol 75, ethyl alcohol 300, water 300, titanium dioxide 90, and sorbitol lactate 64. The coating is stated to be stable under extreme climatic conditions and does not exhibit any tendency to become brittle or tacky under such conditions. The coating is destroyed on contact with water. C.J.W.

PUTNAM, CHARLES P., and BAKER, WEBSTER E. B. Coating apparatus and method. Canadian patent 451,236. Filed April 10, 1946. Issued Sept. 14, 1948. 22 claims. Assigned to New York and Pennsylvania Co., Inc.

A coating machine consists of a coating pan, a fountain roll dipping in the pan, a breast roll adjacent to the fountain roll for receiving the web, and a tube adjacent the breast roll which contains an orifice for ejecting gas therefrom at high velocities to pick up gas from the surrounding atmosphere and form a gas brush sweeping over the face of the web on the breast roll in a direction opposite the direction of travel of the web to brush the excess coating from the web; means are provided for receiving the excess coating material and gas, for directing the gas away from the web for recirculation to the gas brush, and for returning the coating material to the pan. C.J.W.

PAPER SPECIALTIES

BRYCE, WILLIAM H. Wrapping for commodities. Canadian patent 451,343. Filed Dec. 27, 1944. Issued Sept. 21, 1948. 5 claims. Assigned to Dixie Wax Paper Company.

A moisture-vaporproof wrapper having heat sealing properties consists of a glassine sheet treated with an aqueous solution of dextrose and glycerin (to render the sheet highly plastic) and then coated with a wax composition. The coating composition consists essentially of paraffin wax which contains about 8% of polymerized isobutylene milled with paraffin wax in a solid solution and about 6.5% of an unmilled thermoplastic resinous powder prepared by treating rubber with a halide of an amphoteric metal. Details of the preparation of the composition are given. C.J.W.

CRAIG, KENNETH A., and AUCHTER, RICHARD J. Panel facing. U. S. patent 2,448,357. Filed Nov. 29, 1945. Issued Aug. 31, 1948. 4 claims. Assigned to Paper Patents Company.

The anchor sheet is formed of sulfite pulp coated on one side with urea-formaldehyde resin; the dried impregnated sheet should contain about 30% of the resin and should weigh 30-40 pounds per 3000 sq. ft. The facing sheet may be of sulfite pulp or a mixture of 75% sulfite and 25% soda pulp; it is impregnated with phenol-formaldehyde resin and the finished sheet should contain 30% of the resin and weigh 65 pounds per 3000 sq. ft. The anchor sheet and one or more of the facing sheets are heated about 20 minutes at 325° F. and a pressure of 800 p.s.i. The composite can be adhered to the sanded surface of a plywood panel. C.J.W.

DE REAMER, WILLIAM J. Packing material. Canadian patent 451,088. Filed July 3, 1947. Issued Sept. 7, 1948. 4 claims. Assigned to Mapes Consolidated Manufacturing Company.

A cushion pad suitable for the packing of eggs is described. C.J.W.

FARRELL, ROBERT A., and WAGNER, CHARLEY L. Method of applying heat-sealable labels. U. S. patent 2,446,414. Filed Sept. 30, 1944. Issued Aug. 3, 1948. 5 claims. Assigned to Marathon Corporation.

The label is formed of a relatively porous sheet and a dense or relatively impermeable sheet united by microcrystalline wax (melting at 140-160° F.) or a mixture of 92% of this wax, 3% aluminum stearate, and 5% ester gum. Examples of combinations of papers are: porous dry-wax sulfite tissue and high wet-strength bleached kraft paper or regenerated cellulose, and porous sulfite tissue and supercalendered sulfite paper, highly plasticized glassine, or highly hydrated greaseproof sulfite. The labels are particularly suitable for application to cellophane. C.J.W.

REUCASSEL, WILLIAM. Waterproof wrapping. Canadian patent 450,867. Filed June 8, 1943. Issued Aug. 31, 1948. 3 claims. Assigned to Champion Paper Mills Limited.

The waterproof wrapping consists of a sheet of tough-texture paper impregnated with and having a coating of an amorphous wax and a sheet of cellulosic material adhered to one surface of the sheet and also coated with amorphous wax. The wax consists of a mixture of 70% of a wax melting at 150-155° F. and 30% melting at approximately 165° F. C.J.W.

RINGLER, WILLIAM A. Paper bag. Canadian patent 451,134. Filed June 5, 1947. Issued Sept. 7, 1948. 1 claim. Assigned to Wolf Brothers.

A carrying bag with a finger opening and locking tongues is described. C.J.W.

SLINDEE, RICHARD O. Cord handled bag. U. S. patent 2,447,964. Filed March 23, 1946. Issued Aug. 24, 1948. 1 claim. Assigned to Lydia Duebener.

A method of attaching a cord handle to a paper bag is proposed in which, when the bag is opened, the cords lie below the bottom of the bag and cannot escape laterally to lose the bottom-supporting function. C.J.W.

SMYSER, JAMES S. Method of applying coating materials. U. S. patent 2,447,374. Filed Oct. 25, 1939. Issued Aug. 17, 1948. 2 claims. Assigned to Behr-Manning Corporation.

This is a continuation of U. S. patent 2,287,837 (June 30, 1942) and relates to the preparation of a suede-like surface on paper or other backing material; the surface of the material is coated with an adhesive and the finely divided fibrous particles are deposited thereon under the influence of an electrical field whose lines of force are so directed as to orient the particles with their major axes at an angle of 45 to 60° with respect to the backing. C.J.W.

VAN DUSEN, CHARLES H., JR. Treated planographic printing plate. U. S. patent 2,448,749. Filed Jan. 24, 1947. Issued Sept. 7,

1948. 4 claims. Assigned to Addressograph-Multigraph Corporation.

A parchment or paper planographic printing plate is impregnated with 2-amino-2-methyl-1,3-propanediol; this is stated to eliminate and prevent the reproduction of finger prints and so-called resin and rosin specks in copies made from such plates. C.J.W.

PIGMENTS

RAFTON, HAROLD R. Machine for impacting pigments against a rotating disk element. U. S. patent 2,448,049. Filed March 16, 1943. Issued Aug. 31, 1948. 3 claims. Assigned to Rafton Engineering Corporation.

The apparatus consists of a disk rotatable in one direction and means for rotating the disk at a high peripheral speed. The disk is provided with peripheral teeth each having a leading face lying substantially in a plane containing the axis of rotation of the disk and a following face sloping inwardly away from the direction of rotation; circumferentially spaced nozzles surround the periphery of the disk and are substantially equidistant from the teeth. The liquid slurry of the pigment is applied to the nozzles under pressure and the jets are struck by the leading faces when the disk is rotating, resulting in an impacting or shocking action on the pigment. The machine has been applied in the treatment of satin white (U. S. patent 2,435,600; *cf.* B.I.P.C. 18: 489) and calcium carbonate (U. S. patent 2,447,532; *cf.* B.I.P.C. 19: 130). C.J.W.

PLYWOOD

BEATY, JOHN D. Plywood. Canadian patent 451,364. Filed March 5, 1945. Issued Sept. 21, 1948. 3 claims. Assigned to MacMillan Industries Ltd. (Plywood Division).

A wallboard consists of a finished plywood panel to at least one face of which has been applied a sheet of resin-impregnated pulp fiber in a substantially dry atmosphere until its resin content is rendered proof against becoming fluid under the subsequent heat of fabrication, the sheet being secured to the plywood with a thermosetting adhesive. C.J.W.

PULP STONES

JEPPSON, GEORGE N. Pulpstone. U. S. patent 2,447,943. Filed Oct. 30, 1945. Issued Aug. 24, 1948. 7 claims. Assigned to Norton Company.

In the manufacture of an artificial pulpstone, a construction is provided in which the portions of the block which are held by the bolts are under compression. A sizeable surface of the block is engaged by a clamping bolt or a washer thereon. Provision is made for relative movement between the blocks and the bolts in a circumferential direction of the stone. C.J.W.

RAYON—CUPRAMMONIUM PROCESS

LIESER, THEODOR. Method of dissolving cellulose in ammoniacal copper compounds. U. S. patent 2,447,514. Filed Dec. 12, 1940. Issued Aug. 24, 1948. 4 claims. Assigned to American Bemberg Corporation.

Cotton linters (50 kg.) are stirred with 600 liters 5% ammonium hydroxide and 21 kg. of copper (in the form of copper hydroxide) several hours at

room temperature and then gradually cooled to −8° C. In place of the hydroxide, the sulfate or oxychloride of copper may be employed. The new process results in a saving of about 50% of ammonia and 17% of copper. Other examples include the solution of wood pulp or other material containing from 96 to 98% of α-cellulose. C.J.W.

SHIPPING CONTAINERS

FREEL, WILLIAM G., and JONES, SAMUEL F. Double-walled foldable carton. U. S. patent 2,447,243. Filed Jan. 21, 1941. Issued Aug. 17, 1948. 3 claims. Assigned to William P. Frankenstein.

A carton of flexible material consists of a bottom, side walls, double end walls spaced apart a substantial distance and connected by a top wall, and corner sections hingedly connecting the end of the side walls with ends of one of the end walls; the corner sections are folded upon themselves and converge across the space between the inner and outer end walls. The double walls may or may not have an air space. C.J.W.

GRECCO, LOUIS P. Divisible carton. U. S. patent 2,448,795. Filed May 24, 1946. Issued Sept. 7, 1948. 1 claim.

A divisible carton for bottles consists of a rectangular fiberboard box having single thickness top, bottom, and end walls (save for gluing overlaps) and two duplicate compartmented fillers, the fillers comprising back to back transverse partitions with glue flaps attached to the sides of the box. C.J.W.

HARNESS, RUSSELL R. Baby chick shipping box. U. S. patent 2,449,222. Filed March 22, 1946. Issued Sept. 14, 1948. 3 claims.

The cover of a compartmented shipping box for baby chicks is provided with a plurality of flaps cut in such a manner that the flaps are individually supported by the partition walls of the box and are adapted to be sealed in pairs by a stapling device. C.J.W.

WILLIAMS, BENJAMIN M. Heavy-duty shipping carton. U. S. patent 2,447,677. Filed June 16, 1947. Issued Aug. 24, 1948. 2 claims. Assigned to Gaylord Container Corporation.

One side wall of the tubular liner above the lower slip cover is provided with flaps which can be swung outwardly to provide access to the lower portion of the liner and which can be swung back to wall-forming position to permit the upper slip cover to be telescoped over the upper end portion of the liner. C.J.W.

ZALKIND, PHILIP. Joint for collapsible containers. Canadian patent 451,311. Filed Nov. 13, 1943. Issued Sept. 21, 1948. 4 claims.

A collapsible container has a hinge connecting a pair of adjacent walls, the hinged connection comprising a member secured to one of the walls passing through the base of a recess in the wall and secured to the other wall at the base of a projection thereof. The walls are rotatable about the hinge connection to a predetermined angular relation. Adjacent edges of adjacent walls have projections and recesses interlocking with each other when the walls are in the rotated position. C.J.W.

SHIPPING CONTAINERS—MULTIWALL BAGS

ALLEN, HENRY H. Method of closing bag tube ends. Canadian patent 450,850. Filed May 17, 1946. Issued Aug. 31, 1948. 2 claims. Assigned to Bemis Bro. Bag Co.

A method is described for sealing an open bag top by means of an adhesive applied to the inner marginal edges of the walls. C.J.W.

ALLEN, HENRY H. Method of closing bag tube ends. Canadian patent 450,851. Filed May 17, 1946. Issued Aug. 31, 1948. 5 claims. Assigned to Bemis Bro. Bag Co.

A bag body is sealed by pressing the walls into flatwise relation with the edge walls intucked between the side walls and folding a strip of tape over the flattened ends. C.J.W.

SHIPPING CONTAINERS—PALLETIZING

SIMONTON, BUDD E., and DYER, HOWARD J. Pallet. U. S. patent 2,447,285. Filed Oct. 8, 1946. Issued Aug. 17, 1948. 1 claim. Assigned to St. Regis Paper Company.

A two-faced pallet consists of a base member of double-faced corrugated board; a platform member of the same material; and a plurality of relatively stiff, hollow, cylindrical cardboard spacer members between the two; the spacer members are so arranged as to permit the insertion of lift fingers. C.J.W.

SULFUR DIOXIDE

HIXSON, ARTHUR W., and MILLER, RALPH. Recovery of acidic gases. U. S. patent 2,449,537. Filed July 12, 1946. Issued Sept. 21, 1948. 12 claims. Assigned to The Chemical Foundation, Incorporated.

Sulfur dioxide can be recovered from flue gas and the like by passage through ammonium hydroxide and reacting the solution of ammonium bisulfite with an acid fluoride under conditions regulated to evolve sulfur dioxide. C.J.W.

TALL OIL

RICE, WILLIAM J. Composition containing tall oil resins. U. S. patent 2,448,621. Filed April 10, 1945. Issued Sept. 7, 1948. 9 claims.

This is a continuation of U. S. patent 2,373,709 (April 17, 1945) and relates to coating compositions, paints, or enamels containing tall oil. In one example, a mixture of 570 parts of tall oil and 420 parts of rosin is heated 45 minutes at 400° F., 10 parts of borax are added, and the heating is continued (30 or 60 minutes) while 114 parts of lime are added slowly with stirring; the resulting resin can be diluted with an equal volume of water to form a viscous emulsion, which is capable of further dilution with water or mineral spirits. A resin can be formed from 990 parts of tall oil, 114 parts of lime, and 10 parts of borax. These resins can be used in the manufacture of gloss paints and the like; a typical formula is given. C.J.W.

TEXTILE INDUSTRY AND FABRICS—ROTPROOFING

MEYER, FREDERICK J. Preservation of cellulosic materials. U. S. patent 2,449,787. Filed Oct. 9, 1944. Issued Sept. 21, 1948. 7 claims. Assigned to The Dow Chemical Company.

Rot- and mildewproofing agents for textile materials (paper is mentioned but no example is given) include halogen derivatives of phenoxyacetic acid and their metallic salts (especially the copper and zinc salts). The 2,3,4,6-tetrachloro derivative is effiective in a concentration of 3-4% but not in 1-2%. The corresponding propionic and butyric acids can be used. C.J.W.

TEXTILE INDUSTRY AND FABRICS—TESTING

HOOD, ROBERT L. Fabric abrading tester. Canadian patent 450,079. Filed Nov. 10, 1945. Issued July 27, 1948. 1 claim. Assigned to American Cyanamid Company.

This is equivalent to U. S. patent 2,423,704 (July 8, 1947); *cf.* B.I.P.C. 17: 745. C.J.W.

(Continued from inside front cover)

Kenyon, W. O. ..... 80, P 130
Kinsinger, W. G. 96
Kirk, D. ..... P 133
Klein, F. S. 98
Krajčinović, M. 116
Kratzl, K. 90
Kroll, H. 112
Kürschner, K. 125
Laemmermann, F. W. 93
Lahey, F. N. 90
Laird, B. C. 81
Lampitt, L. H. 117
Lang, R. 95
Langlykke, A. F. 74
Langston, Samuel M., Company ... 93
Lanigan, F. W. ..... P 133
Larinkari, J. 75
Lathrop, E. C. 75, 118
Latimer, R. 104
Lawrance, W. A. 120
Leas, L. ..... P 134
Leavenworth, C. S. 117
Lee, S. B. 84
Lee Paper Company ..... P 134
Lieser, T. ..... P 137
Lillie, A. R. 85
Lindsay Wire Weaving Company .. P 134
Lortz, R. 113
Lowgren, U. 75
Lyons, E. L. 89
Macey, A. 116
McFarlane, W. D. 111
McGee, P. A. 80
McGovern, J. N. 121
McGregor, R. R. ..... P 134
Maclay, W. D. 105
MacMillan Industries Ltd. (Plywood Division) ..... P 137
McMurtrie, D. H. 80
Malcolmson, J. D. 115
Malm, C. J. 81
Mapes Consolidated Manufacturing Company ..... P 136
Marathon Corporation ..... P 136
Margot Corporation ..... P 132
Marston, H. R. 84
Marzolf, S. B. 84
Mason, T. W., Jr. 105
Mather, G. 114
Mathewson, W. F. ..... P 134
Mathiesen, E. 99
Merewether, J. W. T. 90
Meyer, F. J. ..... P 139
Michigan Carton Company ..... P 131
Mickelson, O. 104
Mill, C. C. 89
Miller, R. ..... P 139
Millman, N. 82
Mitchell, W. A. J. ..... P 131
Morgan, P. W. 109
Morlier, O. W. 85
Mory, H. 76
Murray, T. F., Jr. ..... P 129
National Folding Box Company, Incorporated ..... P 133
National Urn Bag Co., Inc. P 132, P 133
Nelson, G. H. 118
New York and Pennsylvania Co., Inc. P 135
Noelting, G. 117
Noll, A. 106, 108, 127
Norton Company ..... P 137
Ögland, N. J. 77
Owens, H. S. 105
Paper Patents Company ..... P 135
Paper Sales 102
Patton, E. L. 125
Pauley, R. D. ..... P 129
Pearl, I. A. 122
Peat, S. 116
Peede, L. G. 86
Penn, W. S. 81
Penn Fruit Company 79
Pew, J. C. 127
Porter, R. W. 99
Poulter, S. R. C. 89
Pucher, G. W. 117
Putnam, C. P. ..... P 135
Quinn, D. 78
Raffold Process Corporation ..... P 130
Rafton, H. R. ..... P 130, P 137
Rafton Engineering Corporation .... P 137
Ratliff, E. K. 81
Reid, J. C. 89
Renner, M. S. 117
Resinous Products & Chemical Company 126
Reucassel, W. ..... P 136
Rice, W. J. ..... P 139
Richter, J. 83
Richter, J. C. F. C. ..... P 131
Riddell, G. L. 111, 115
Ringler, W. A. ..... P 136
Risler, C. B. 94
Ritchie, J. L. 99
Ruperti, A. ..... P 130
Russel, A. N. ..... P 133
Russell, A. 90
The Rust Engineering Company 91
St. Regis Paper Company ..... P 139
Samuelson, O. 110
Schniepp, L. E. 120
Schnyder, A. P. ..... P 129
Schur, M. O. 80
Schwartz, S. L. 78
Sciascia, M. ..... P 132
Sharrard, G. F. ..... P 129
Sheahan, J. D. 97
Shearon, W. H., Jr. 125
Shingler, G. P. 125
Silcox, H. E. 84
Simonton, B. E. ..... P 139
Simplex Paper Corporation ..... P 133
Skeen, J. R. 112
Slindee, R. O. ..... P 136
Smyser, J. S. 136
Stephansen, E. 107
Stone, E. ..... P 131
Strepp, H. 85
Sutcliffe, H. M. 118
Sutherland Paper Company ..... P 131
Swoboda, O. 123
Tanghe, L. J. 81
Technical Association of the Pulp and Paper Industry 121
Tennent, C. B., Sr. ..... P 133
Thomas, E. E. 92
Timber Engineering Company ..... P 132
Tinker, E. W. 99
The Todd Company 104
Treitel, O. 84
Turner, H. D. 78
U. S. Department of Commerce ... 100
U. S. Secretary of War ..... P 135
Unruh, C. C. 80
Valz, A. M. 79
Van den Akker, J. A. 78
Van Dusen, C. H., Jr. ..... P 136
Van Lanen, J. M. 74
Venkajee, T. 100
Vickery, H. B. 117
Wacek, A. v. 90
Wagner, C. L. ..... P 136
Waldron, John, Corporation 93
Waldron, L. J. 84
Weston, A. D. 120
Weyerhaeuser Timber Company ... P 129
Wheeler, D. H. 123
Whitaker, A. C. ..... P 135
White, R. ..... P 133
Whiting, G. 77
Wickerham, L. J. 120
Widmer, G. 112
Wilfinger, H. 126
Williams, B. M. ..... P 138
Williams & Wilson Limited ..... P 133
Winding, C. C. 109
Wink, W. A. 78
Wise, L. E. 81
Wolf Brothers ..... P 136
Wood, A. H. ..... P 133
Woolley, R. B. 86
Wurz, E. 110
Wurz, O. 110, 123
Yackel, E. C. ..... P 130
Yuma Frozen Food Company 104
Zalkind, P. ..... P 138
Zellerbach, J. D. 79

LIBRARY SERVICE

The Library of The Institute of Paper Chemistry is located in the Kimberly Memorial Building. Its purpose is to serve the students and the faculty of The Institute of Paper Chemistry and the chemists and technologists of the pulp and paper industry.

To contributing members it gives the following service:

A monthly bulletin is issued, listing all new books and periodicals added to the library and containing titles and abstracts of articles published during the previous month in the field of pulp and paper chemistry and technology. The annual index carries a list of periodicals currently received.

At a reasonable cost the librarian will furnish complete reference lists on chemical and technical problems for member mills, and will procure translations, photostats or abstracts of the articles listed. Upon request, member mills working on special problems will be kept in touch with new publications related to their work.

Reviews of new publications pertaining to the field of pulp and papermaking will be included from time to time.

The library is open daily with the exception of Sundays from 8:00-5:00 and from 7:30-9:30. Saturday it closes at 5:00 o'clock.